

ALAGAPPA UNIVERSITY

(Reaccredited with 'A' Grade by NAAC)
Karaikudi 630 003



DIRECTORATE OF DISTANCE EDUCATION

(Recognized by Distance Education Council (DEC), New Delhi)

M.B.A.
(Banking & Finance)



Paper - 4.3

Investment and Derivatives Markets

ALAGAPPA UNIVERSITY

(Accredited with 'A' Grade by NAAC)

KARAIKUDI - 630 003, TAMILNADU

DIRECTORATE OF DISTANCE EDUCATION

M.B.A.

(Banking & Finance)



PAPER - 4.3

Investment and Derivatives Markets

68. [Jasper Printers,Vnr] AU/DDE/D2/Ptg/02/2012-13 dt.02.07.12 [Copies : 400]

INVESTMENT AND DERIVATIVES MARKET

UNIT 1 : Debt Market: Debt instruments: Nature and varieties - Debt market fea tures in India - Debt pricing Theorems - Convexity - Duration - Risk and Return structure.

UNIT 2 : Debt portfolio management: Concept and importance - passive Immunisation - Active management - Horizon analysis - Bond Swaps.

UNIT 3 : Equity market: Equity investment: Nature and features - Factors governing equity market growth.

UNIT 4 : Equity valuation models: Dividend model - Zero growth model - Constant growth model - Multiple growth model - Models based on P.E. ratios - Earnings based models.

UNIT 5 : Govt. Securities market: Instruments - Operations - Significance

UNIT 6 : Options market - Concept - Types of options - Value of options - Valuation at expiration - Profits and Losses on calls and puts - Profits and Losses of some option strategies - Index options.

UNIT 7 : Future market - Concept and significance - Futures contract - Futures market - Basis - Returns on futures - Futures Vs Options.

Course Materials Prepared by : **Dr. M. SELVAM**
Dept. of Commerce
Alagappa University
Karaikudi

* * *

UNIT I DEBT MARKET

In this unit the nature of debt market, debt instruments, debt-market features in India, debt pricing theorems, convexity, duration, risk-return structure, etc are dealt with.

1.1 DEBT MARKET

Debt market is the market for creditorship or debt securities, which generally carry a coupon on a fixed face value or principal. Debt securities are many: government securities, Treasury Bills, PSU Bonds, Commercial Papers, Certificate of Deposits, Financial Institutions' Bonds, Corporate Bonds, Commercial Papers, etc. There are government, corporate and quasi-government agencies operating in the debt market by offering securities. Individuals, investment bankers/ institutions, etc take up the securities parting their liquidity with. To facilitate all these are happening fine, financial intermediaries exist. SEBI is a regulator of the market players, in India. In US, the SEC is the regulator. There are primary and secondary market segments. The primary market involves mobilizing funds from the investing community. For a promised future cash flows the investing community parks its liquidity with the fund mobilizers. The secondary market is market for creating liquidity for investors who want to liquidate their debt holdings. There are wholesale and retail debt markets as well. The wholesale debt market has, the Governments, NSE, banks as major players. The .paretail market is market for small investors. Debt market does well when equity market falters. The internal debt of the Govt. of India was Rs. 7183 bn (as on Dec. 1997). Debt market flourishes when equity market suffers. The market capitalisation of debt is put at 40% of GDP or Rs. 4,60,000 crs in 1996-97.

1.2 DEBT INSTRUMENTS: NATURE

Debt instruments have certain common features, though variety exists.

1.2.1 Nature of Debt Instruments

Debt instruments carry a coupon payable periodically. Debt instruments are generally fixed income bearing. Cautious and risk averse investors prefer debt instruments generally. Debt instruments do not enjoy appreciation nor suffer depreciation. The expected return on debt instruments is lower than that on equity as risk of debt instruments is lower than that of equity. Debt instruments' secondary market is very thin, especially at the retail level. At wholesale level, NSE has generated volume. Debt instruments have a fixed maturity. Value of debt instruments vary with ruling interest rates. If the coupon rate is greater than ruling interest rates, the debt instrument's value rises and vice versa. Debt instruments quote below par, as secondary market pressure is not strong. Debt instruments have to be credit rated.

1.2.1.1 Return on debt instruments

Rajiv Handa gives a different-treatment to return analysis as to bonds. While most know that returns from equity comprise cpital appreciation and dividends, what comprises return on bonds? The total returns on bonds include three principal elements.

-Initial yield, Reinvestment rate and Impact of rate changes, points out Rajiv Handa.

The first of these three factors is the ultimate fundamental. The initial interest rate has been by far the major determinant of the future returns on bonds. It is reasonable, for example, to assume that bond with an eight percentage coupon will achieve an annual return of eight percent if held to its maturity.

This observation, however, is not always correct. Only if the semi-annual interest coupon is reinvested at the same rate of eight percent will the cumulative return equate to eight percentage annually. If the reinvestment rate is much higher over the term of the investment, the return will be reduced to the extent.

Take an exmple. Suppose you invest Rs.10,000 in eight percent bonds with a maturity of 20 years. There can be three situations - interest rates fall to six percent (lower than the reinvestment rate), remain stable at eight percent (unchanged reinvestment rate) or increase to 10 percent (higher reinvestment rate). What will happen to the investment in each of these situations?

In all the three cases, the principal payment on maturity remains the same - Rs.10,000. There is no change in interest receipts which for the 20 year period remain at Rs.16,000. However, if we were to consider the three changed interest rate environments, the return on reinvested interest will come to Rs.14,200, Rs.22,000 and Rs.32,300 respectively.

The increase in rates raises the final value of the eight percent bond from Rs.48,000 to Rs.58,300. More than half of this value is accounted for solely by the reeinvestment effect, a factor so often ignored in the clculation of bond returns. At the six percent reinvestment rate, the accumulted total of Rs.40,200 is only 85 percent of the accumulation achieved at eight percent reinvestment level. These figures

are invalid unless the bond is held to maturity.

The third component of bond returns is the impact of the change in interest rates on a bond's market price, when it is valued prior to its maturity. An instantaneous increse in rates from eight to ten percent would reduce the market value of a 20 year bond with an eight percent coupon from Rs.10,000 to Rs.8,300 (decline of 17 percent).

An instantaneous drop from eight percent to six percent would increase the bond's value from Rs.10,0000 to Rs.12,300. Barring a default, such a paper loss or gain would gradually be reduced and finally eliminated as the bond approached its maturity date.

However, significnt interest rate changes do not take place overnight. And the rate of interest at which interest coupons are re-invested varies over a large number of intervals (40 semi-annual reinvestment dates for a 20 year bond).
With all this average exercise, the combined impact of reinvestment rates and changes in the general level of interest rates has only rarely been the dominant force in explaining bond returns over 10 year period.

Thus, the initial yield is the primary determinant of long-term bond returns. On an average, it has explained more ethan 80 percent of the total returns in each of the last six decades. As stated earlier, the returns are purely a factor of the duration and the interest rate.

Now let us attempt certain measures of return and value.

Return Measures :

(i) Current yield = Annual coupon interest/Current price

(ii) Actual yield = Annual Coupon interest/Actual purchase price

$$\text{(iii) Yield to maturity (YTM)} = \frac{\text{Annual Coupon} + \frac{RP - IP}{N}}{(RP + IP)/2}$$

Note: RP = Redemption Price; IP = Issue Price; N = Years to Redemption

$$\text{(iv) Average Anticipated (YTM)} = \frac{\text{Annual coupon} + \frac{\text{Premium over par or discount below par}}{\text{No. of years to maturity}}}{(\text{Current price} + \text{Face value}) / 2}$$

Yield to maturity is also calculated using the following valuation modal.

Tax present value of a bond is given by formula :

$$FV = \frac{Coupon_1}{(1+K)} + \frac{Coupon_2}{(1+K)^2} + .. + \frac{Coupon_n + \text{Redemption value}}{(1+K)^n}$$

where K = expected yield on bond, PV = present value, 'n' = number years to maturity.

A Rs.1000 facee value debt redeemable after 3 years with an annual coupon of 6% and K = market cost of debt of 10%, will have a present value of:

$$= 60/(1.1) + 60/(1.1)^2 + 60+1000/(1.1)^3 = \text{Rs. } 900$$

Present value with semiannual coupon will be :

$$\frac{\text{Rs.}30}{(1+.1)^{.5}} + \frac{\text{Rs.}30}{(1+.1)^{1}} + \frac{\text{Rs.}30}{(1+.1)^{1.5}} + \frac{\text{Rs.}30}{(1+.1)^{2}} + \frac{\text{Rs.}30}{(1+.1)^{2.5}} + \frac{\text{Rs.}1030}{(1+.1)^{3}}$$

= Rs.933

With increase frequency of interest payment, value increses.

A bond with lesser maturity period leads higher value and vice versa.

Assume the above referred to bond is redeemable in 2 years. Then the PV will be :

$$60/1.1 + 60+1000/(1.1)^2 = 930$$

The value is higher than the one we obtained earlier when the bond was redeemable after 3 years, the value was just Rs. 900.

It is evident that, as maturity period is closer and closer, bond value will approximate its face value, provided the coupon rate and ruling interest are not divergent. It is easy to prove, with a coupon of 10% and ruling interest rate of 10%. the resale value of a bond whose maturity period is just a year ahead. is,

Rs.(100+1000)/(1+.1) = Rs.1000, which is the face value too.

When the coupon rate is higher than the ruling rate, bond value will exceed par value. For instance assume a coupon of 12% on a Rs.1000 bond, redeemable after two years. Let the ruling interest rate is 10%. Then PV = $120/1.1 + 1120/(1.1)^2$ = 120 X 0.909 + 1120 X .826 = 109 + 925 = Rs.1034.

If we take market prioce as the PV, the value of K, for which the right hand side is equal to left hand side of the equation given above, is taken as the yield to maturity. Formula (iii) seen above is an approximation of the above method.

1.2.1.2 Risk of debt instruments

There are several risk components and types. Besides, risk complexion of individual investment differs from that of a portfolio, which is nothing but a basket of investments. All these aspects are presented below.

1.2.1.2.1 Diversifiable Vs Unidiversifiable Risk:

Diversifiable risk is also known as unsystematic risk and it stems from factor specfic to particular firms or industries. Difficulty in entering certian markets, plant break down, strife in relationship between management and employees etc., are some firm/industry-specific factor causing risk. Undiversifiable risk is that which cannot be reduced even with diversification. Undiversifiable risk affects uniformly all industries, all firms and all investment avenues. The risk is also known as systematic risk and stems from macro-level factors like inflation, political factors, internal peace and stability of economic systems adopted, public spending

etc. Of course, these factors affect all firms, though not uniformly. The systematic risk is borne by all investors, while shrewd investor avoid unsystematic risk by planned diversification.

The different risks can be further classified as: interest rate risk, callability risk, convertiability risk, default risk, management risk, liquidity risk, market risk, purchasing power risk, political risk and exchange rate risk. Each type of risk has diversifiable and undiversiable component. All risks when aggregated, we get the total risk of an investment security. Diversifiable risk is that part of total risk which can be reduced (investors prefer to reduce risk) by investing in a plural number of securities. Assume that company A's security yields good returns when there is a good monsoon and B's security yields well when there is a drought when one invests one's fund in part in both the securities, whether or not there is good monsoon or a drought, one is sure of a moderate, stable return. But, when one puts all fund in either A or B, one's returns will fluctuate. Don't pull all eggs in one basket thus, is the logic.

1.2.1.2.2 Security Risk Vs. Portfolio Risk:

So far the discussion centred on the types and components of risk. Now the risk of an individual investment security and that of a portfolio are dealt with. Individual securities always have both the diversifiable and undiversifiable risk components. A portfolio is a basket of investments, wherein .pathe attempt is to reduce the diversifiable risk to the minimum. True with less risk the overall return earned is also a bit lower; less risk, less return -is the rule of the game. Of course, the diversifiable risk remains the same for a single as well as for a well diversified portfolio of securities.

The question is why the diversifiable risk component of a portfolio is generally less than that of an individual security? The portfolio risk is influenced by three factors, viz., the proportion of individual securities in the portfolio, the standard deviation of return of individual securiteies and the correlation coefficient between the returns of pairs of individual securities. Of these, the correlation coefficient is a very crucial factor. It tells the direction of movement of the returns of pairs of individual securities. When the returns move in the same direction, the correlation is +ve, portfolio risk is increased. When the returns move in the opposite direction, the correlation is -ve. portfolio risk is decreased. If it is equal to one - the maximum possible, the portfolio risk is maximised and if the correlation is zero, the risk is moderate.

It is this relationship between portfolio risk and correlation coefficient of the pairs of securities of the portfolio, that was brought to light by the Noble Prize Winner Prof. Harry Markowitz. In a multi-security portfolio, when several pairs of securities have negative or near negative .pacorrelation coefficients, the portfolio risk would be lower and vice versa. So, not all diversifiaction reduces risk. Only a Markowitz type diversification, with many pairs of securities with low or negative correlatin coefficients or returns, reduce the portfolio risk.

Beyond a certain level of diversificaiton, further addition of securities to the portfolio does not reduce risk anymore. At this stage the portfolio is sufficiently diversified with portfolio risk equal to market systematic risk or undiversifiable risk. About 20 securities would be sufficient to build a balanced portfolio, it is said.

1.2.1.2.3 Components of Risk

There are several components of risk. These are dealt below.

Interest Rate Risk:

Interest rate risk arises due to fluctuations in market interest rate. Consequent to change in market interest rate, the potential return from a security fluctates. Debenture interest rate in India was recently unfreezed. It is possible that the coupon rate on a debenture/bond is more or less than the market sentiment. Now the interest on risk free government bonds is high. All market rates get adjusted upwards accordingly. The coupon rate on bonds issued earlier is, therefore at variacne with the present market interest rate. This variation is denoted as risk in the parlance of investment management. Interest rate change affects not only bondholders but also equity security earlier borrowings change and consequently equity earnings also change. So, return on equity varies whenever market interest rate and coupon rate on bonds are at variance. Hence the significance of interest rate risk for all classes of investors.

Interest rate risk can be segregated into diversifiable and diversifiable components. The diversifiable interest rate risk is specific to some firms. A firm that is teetering on the verge of a financial collapse cannot rasie funds at market rate of returns. Investors who have included the particular firm's securities in their porfolio would experience flucutations in the portfolio return. They can, however reduce the risk or their portfolio by diversifying, i.e., skipping the firm and investing in other firms. Earlier it is done, the better. By investing in bonds with different credit ratings this risk can be reduced.

Undiversifiable interest rate risk cannot be reduced even with diversifications. This results when there is a wholesale change in the market rates in the economy. Say at a particular time the demand for 'AAA' grade bonds (blue-chip bonds with lowest coupon rates) has outstripped the supply. Taking advantage of the upbeat sentiments bond issuers would further reduce interst rate. Consequently part of the demand for 'AAA' grade bond, gets diverted to 'AA' grade (High quality but not blue-chip with slightly higher coupon rate than 'AAA' grade) pushing up the demand for 'AA' grade.

This results in decrese in the interest rate on 'AA' bonds. Like a wave-wise pattern, there is an all round drop in interet rate. A reverse trend can also happen any time. These wholesale shifts in interest rates affect returns made by investors, whether or not they change their portfolios. They are helpless and cannot reduce the variability in return due to the market - wide change in interest rates.

Callability Risk:

Debt securities and preferred stock may be called for redemption at a specified time, anytime during a certain peirod or any time at will of the issuers, in whole or part. When part redemption is effected, the company may adopt lottery method to pick up the distinctive bonds/stocks for redemption. Such callability is an intrusion in the investors' portfolios. Suddenly they are left with liquidity which they have to deploy effectively which would involve some time and cost. Hence their earnings are affected and this variability in return is referred to as callability risk.

Calability risk may be diversifiable or otherwise. When only few firms exercise the convertibility provision as per the terms of issue, the investor concern can

diversify away the calability risk by avoiding scrips with calability provisions. On the contrary, due to general decline in interest rate, if all firms exercise callability provision to retire higher coupon bonds with lower coupon bonds, the risk cannot be reduced through diversification. Variability in return on portfolio is happening across the board.

Convertibility Risk:

In theory, companies whose equity stock price is some what depressed at the moment, go for issuing convertible securites and later exercise conversions when equity price has turned favourably. Until recently, there was a growing equity - cult in Indian capital market. The convertible issues were overwhelmingly received as the allottees, would get equity stock. And what is the risk involved here when the investors are particularly happy with the convertible securities? One need to remember that risk means variability in return. And when conversion is effected,the pattern and scale of return varies. Temporarily even equity returns might dip. Hitherto, on the convertible security a steady and periodic return was obtained.

On conversion into equity, return will fluctuate. Hence the conversion risk. The timing of conversion, conversion ratio and pattern of return on converted securities, etc., affect the complexion of convertibility risk. Convertibility risk is generally diversifible as variety in conversion is generally the rule. If all firms have uniform conversion terms, perhaps an element of systematic (i.e undiversifiable) risk emerges. But such uniformity is a rarity.

Default Risk:

This is by far the most important of all risks. When a firm defaults in payment of contractual payments like interest on debt securities and/or repayment of principal, default risk haunts the investments. When a firm defaults interst payment, return on equity and preferred stock would, also, be thrown to a fluctuating fate due to stock market reactions. Default risk is somewhat tied up with highly levered capital structure. In lean years of profit, debt servicing becomes under heavy strain. Since the high-leverage is an important cause,default risk is also come to be known as 'financial risk', risk arising due to methods of financing adopted. Default risk is not something sudden, except when "acts of god" destroy the fortunes and property of a concern: That is, default risk can be foreseen in normal situation using serveral financial forecasting, and analytical tools. It is with the help of these tools, bonds are classified by credit rating institutions like CRISIL, ICRA, Standard and Poor's etc. High grde bonds are given 'AAA'or AA, the medium grade 'A' or BBB, and speculative grades ar given BB or B. Default grade bonds are given C,D, etc. in the order from bad to the worst.

Let us come to the diversifiable and undiversifiable componetns of default risk. A recession, a credit sequeeze,hike in terest rate etc. would push down the marginal firms into chaos adding more number of firms in the default category. Even firmly established concerns might find the going difficult. Say, 10% of firms are normally accorded the default grade. This is unsystematic or diversifiable. One can avoid them Say, in a particular year due to monetary stringency. additional 10% of firms are thrown into financial disaster and the "grades" of the other firms are also rated lower. This is the undiversifiable default risk as financial stringency affects whole of trade and business. Variation in retunrs of even well diversified

portfolios is experienced if tight monetary policy is adopted. **Management Risk.**

Variation in return on investments caused by management decisions is called management risk. In the choice of firms for investment,investors keenly consider the quality of management of the firms. Managements with proven record, promoters with a clean tract, visioanary and missionary management are favoured by investors. Good managements even insure against "Acts of God" it is said. All said and done, 100% insulation from bad decisions of management is not possible. Management is capable `of Mmismanagement. Management risk as a component of toal risk of an investment is always present. Regarding management errors, we need not elabrate. They are infinite and as varied as fingerprints and cornflakes. Managers are 'agents' of the equity stakeholders. Agents' actions need not always be optimal and in the interest of providers of capital to the firm. The divorce between ownership and management is a cause contributing to fluctuations in returns on investments. Managers have to compete with both within and outside and their performacne is market - tested. They gain, if their performance is rated well, by career advancements. So, they always strive for optimal performance even though they are only agents. Let us forget the difference, if any between onwer - managers and employee - managers at the moment. Basically, both are human and as mortals they incidentally make wrong judgements, for which investors pay. Hence the management risk. Most mutual funds in India are at present sub-optimally performing. The fund managers are squarely responsible for this. The systematic component for management risk is caused by the uncertain business environment in which every manager is operating. The unsystematic component is accounted by the firm specific management weakness.

Market Risk:

Market risk is defined by Jack Clark Francis as "that portion of an investment's total variabiliity of return that is caused by the bull and bear market conditions". Persistent upward move in stock price index is alled as a 'bull market' the opposite situation is know as bear market.' Bull and bear markets alternate in stock exchange and security prices fluctuate, for an apparent fundamental change in the intrinsic merits of the securities, but purely due to variations in demand and supply factors caused by bullish/bearish trend in the stock market. The BSE SENSEX role to dizzy height of over 4630 points by Sep., 1994. It fell down later to less than 3000 points in May 1995 and then recovered to 3350 points by mid June 1995. In March 1998 it is still around 3650 points only. Now in Feb 1999, it is around 3300. Bull and bear phases are thus the order.

Market risk is also divisible into diversifiable and undiversifiable. Diversifiable market risk is said to prevail when a minority of securities remain stable or move in opposite direction to the market trend. In a bulish market, these securities either do not appreciate or do suffer downslide and vice versa. This happens because of exclusive factors affecting the firms concerned. On the contrary, undiverisifiable market risk arises due to a combination of market-wide systematic factors. We can quote the downswing in stock market in India that followed the unearthing of the scam as systematic risk.

Liquidity Risk:

Liquid investments are those that can be realised in cash with no loss of time and value. Illiquidity means either a time loss or value loss or both in realisation.

Liquidity risk therefore refers to variability in return due to illiquid features of an investment. In its realisation one has to pay additional commission, offer more discount, and/ or wait for sometime. Listed securities have less liquidity risk than unlisted; equity securities have lesser liquidity risk than debt securitires; junk bonds have higher liquidity risk than defalut grade bonds and so on.

Purchasing Power Risk:

A good investment should provide periodic return and appreciate in real terms rather than in nominal money terms,so that the investor is protected against erosion in the real value of investment. Due to money illusion, that is overt concern for quantity of money rather than for its quality - i.e., the purchasing power, many of us are putting our hand earned funds in investments which hardly earn anything in real terms. This is the fate of debt securities. The investment is not hedged against inflation and the investor suffers loss in real terms. The consequent fluctuation in return is called purchasing power risk. A portfolio that consists only of fixed return bearing securities has a high degree of purchasing power risk during inflation. Diversificaiton by including equity investments and other securites with growth potential is the only way of diversifying the risk. Diversification is not, therefore, a number game. It is one of character, the portfolio complexion has to be changed. But the ever present inflation, however of a small degree, is causig value dilution uniformly leading to undiversifiable risk.

Polticial Risk:

Variability in return caused by the exploitation of the politically weak group by the politically strong, either through economic or political means for pursuing

economic or political interest of the later, is known as political risk. Political risk can be national or international. National political risk takes the form of political decesions affecting whole or part of businesses. The licensing system had its sway in Indian business till recently. Select business are taxed more while others are livied less. The investors can diversify away the political risk by picking up industries towards whom the Government policies are favourable. But certain measures of the Government, like risk in fiscal deficits, monetary stringency, compulsory schemes of labour participation in management, liberalisation, exit policy, etc.affect all business. This is undiversifiable. International political risk can be seen in two forms. International political factors affecting domestic business interest and domestic legislations affecting international business opeating in the country vis-a-vis domestic businesses. When USA confers the most favoured nation status to a country, that country's business benefit. At the same time when special 301 is used to retaliate against a country that country's business are affected. The effect is the investors experience dispersion in their earnings. Similarly, schemes of ecnomic liberalisation influence non- residents investment options and return on their investments. Hence, the international political risk.

Exchange Rate Risk

Last, when transnational investment are held or when business are,conducted internationally, exchange rate risk takes place. Exchange rate variations are commonplace. A havala rate, a market rate, an official rate, and other ramificaitons are there. These rates themselves are volatile causing variation in returns. Hence, the exchange rate risk. Developing countries import more. Their exports are lower. Hence the exchange values of their currencies are continually depressing. So import intensive business are affected much. Export intensive business gain. But in

transnational business uncertainty in more. So, exchange rate risk is there for both export intensive and import intensive business.

1.2.1.2.4 Measures of Risk

Risk is the variability in return. So any measure of variability can be a measure of risk. In statistics we study range, quartile deviation, mean deviatin, standard deviation, etc. which are measures of variability or dispersion. When we compute these measures with respect to the return of a security, we get the risk of the security.

Say the return on security, Y, for the past 10 years are:

12% , 18%, 13%, 22%, 8%, 5%, 40%, 18%, 20%, and 24%

Range = Highest vlaue - Lowest value = 40%-5%= 35%

quartile deviation = 3rd quartile-1st quartile = 22%-12% = 10%

Mean deviation = sum $|R_i - R|$ where the sign '||' is read as modulus, which means all values are considered positive, irrespective of sign.

$$= \frac{74}{10} = 7.4\%$$

Std. Deviation

The most appropriate measure of risk of a security is the standard deviation

of its returns. The formula is:

$$S.D = s = \left[\text{summ } (R_i - R)^2/n \right]^{0.5}$$

We may calculate the same here. R = Mean = 18%

R_i	$R_i = \bar{R}$	$(R_i - \bar{R})^2$
12	-6	36
18	0	0
13	-5	25
22	4	16
8	-10	100
5	-13	169
40	22	484
18	0	0
20	2	4
24	6	36

$\text{Summ}(R_i - R)^2 = 870$

$$S.D = \text{sum} \left[(R_i - R)^2 \; ^2 \right]^{0.5} = \frac{870}{10}$$

$$= 9.32\%$$

Risk can also be measured using daily-price-based daily return. Say during the last 11 trading days a security had quoted daily beginning of session as follows: 48.50.75.50.51.55.49.50.48.50 and 55

$$\text{Then return for Day 2} = \frac{50 - 48}{48} * 100 = 4.17\%$$

$$\text{Day 3} = \frac{47 - 50}{50} * 100 = -6.00\%$$

$$\text{Day 4} = \frac{50 - 47}{50} * 100 = 6.38\%$$

$$\text{Day 5} = \frac{51 - 50}{50} * 100 = 2.00\%$$

$$\text{Day 6} = \frac{55 - 51}{51} * 100 = 7.84\%$$

Similarly for Day 7. Day 8. Day 9. Day 10 and Day 11. the returns work out to -10.9%.2.04%. -4%. 4.21% and 10% respectively. Simiarly daily return on a stock exchange with repect to a particular index can be calculated taking the closing index of figures as follows:

$$\text{Today's Return} = \frac{\text{Today's Index} - \text{Yesterday's Index}}{\text{Yesterday's Index}}$$

The Daily average return for the 10 day period works out to 1.57%. And the std. deviation comes to : 6.595%. Std. deviation divided by mean return is called coefficient of variation. Which is a relative measure of risk per unit return.

Beta coefficient

Risk can be computed using beta coefficient. We need to be given security return and market returns. Annual figures for several years or daily figures for several days may be given. Market return is based on share price-index of a representative type. We can use BSE sensex daily close index value and get daily return. From this, annual return can be derived using arithmetic average of daily return or using geometric mean. Let us take that we are given the annual returns on Security A and the market, which are as follows for 10 years.

$R\bar{A}$:	$R\bar{M}$:	$R\bar{A} - R\bar{A}$:	$R\bar{M}$ - RM:	(RM - RM)2:	(RA - RA) (RM - RM)
14	11	-2	-2	4	4
18	15	2	2	4	4
17	14	1	1	1	1
-2	-4	-18	-17	289	306
17	13	1	0	0	0
19	14	3	1	1	3
20	19	4	6	36	24
25	22	9	9	81	81
15	12	-1	-1	1	1
17	14	1	1	1	1
160	130	0	0	418	425

$$\text{Beta} = \frac{\text{Sum}: (RA - \overline{RA})(RM - \overline{RM})}{\text{Sum}: (RM - RM)_2}$$

Beta is nothing but the ratio of covariance of returns of the of the concerned investment and the market to the variance of the market returns.

The resulting figures is just a number. Experts say bata coefficients ranges between - 3 and +3. IF it is 1, it means the investment is as risky as the market and moves in the same direction. If it is -1, the investment is as risky as the market, but moves in the opposite direction to the markek.If the market return rises by 2%, then the security return falls by 2%. If the beta is 2, when market return goes down by 2%, the security's return goes down by twice the figures, ie, 4%. If .pathe beta is -2, the security's return is twice volatile as that of the market return but they move in opposite direction. That is if the market's return moves up by 3%, the security's return moves down by 6% and vice versa.

The risk of a security consists of two components, viz., systematic risk and non-systematic risk., Systematic risk, otherwise called as undiversifiable risk, arises due to fluctations in general economic conditions, in people preferences, political factors, etc. These affect all industries, and all securities. Non-systematic risk is specific to a particular firm, security or industry. The fluctations in the sales, in management skills, in productivity and the like of a particular firm affect the return on the equity of that firm. The return fluctuates, resulting in risk. This risk is called non-systematic or diversifiable risk. We know that, a portfolio reduces risk. When we put our money in driverse securities, the non-systematic risk of the different

securities get mutually off-set or adjusted to some extent, reducing the risk of the portfolio. In other words, the portfolio would still have some of the un-off-set non-systematic risk and the systematic risk. A well diversified portfolio reduces unsystematic risk to zero and has only systematic risk.

How do you measure risk of a portfolio? You have to note that portfolio risk is a function of : Wi - relative proportion of the securities in the portfolio, Si = Std Deviation of return or the risk of individual securities in the portfolio and ri.j = correlation of returns of pairs of securities. The popular measures of portfolio risk is standard deviation of portfolio return.

And the formula is: S= (Summ.summ Wi Wj rij Si Sj)0.5

Where,

Wi	=	Weight of the ith security
Wj	=	Weight of the jth security
rij	=	Correlation coefficient of the returns of ith and jth securities.
Si	=	Standard deviation of return of ith security and
Sj	=	Std. deviation of return of jth security.

Let us take an example. A and B are the two investment securities you have. Rs.60,000 is invested in A and Rs.40000 is invested in B. The standard deviation of A and B are 5% and 8%.

The correlation coefficient is 0.8. What is the level of portfolio risk?
WA = 60000/100000= .6; WB = 40000/100000 = .4

SP = (Summ.Summ Wi Wj rij Si Sj)0.5

= Square root of (.6 * .6 * 1 * 5 * 5 + .6 * .4 * .8 * 5 * 8 + .4 .4 * 1 * 8 * 8 + .4 * .6 * .8 * 8 * 5)

= Square root of (9+7.68 + 10.24 + 7.68)

= 5. 882

The portfolio risk will be more if the ri.j is highly positive, moderate when ri .j = 0 and low when ri.j is highly negative. The portfolio risk will be more if the ri.j varies between ±1. In the above problem the rA.A and rB.B are taken as equal to one. These are self-correlation coefficients which are always 1.

Let us take in the above example rA.B = 1. Then,

SP = Square root of (.6 * .6 * 1 * 5 * 5 * .6 * .4 * 1 * 5 * 8 + .4 * .4 * 1 * 8 * 8 +.4 * .6 * 1 * 8 * 5)

= 6.2 %

Let us take the rA,B = 0. Then,

SP = (.6 * .6 * 1 * 5 * 5 + 0 + .4 * .4 * 1 * 8 * 8 + 0)0.5

= (9 + 10.24)0.5 = (19.24)0.5 = 4.5

Let us take the rA,B = -1, then

SP = (9 - 9.6 + 10.24 - 9.6)0.5 = .2

You now understand that when ri,j > o, risk is high, ri,j = 0 risk is moderate and when ri,j < 0 risk is very low. So, while constructing portfolios, you have to

give priority for securities which have negative correlations or low positive in many pairs of securities. This is more so in planned economies.

Take another example. There are three securities in a portfolio : 1.2 and 3. Their individual standard deviation of return is : 5%. 7% and 8%. The proporiton of inve 'ment is : 40, 30% and 30%.

The r1,2 = .8. r1.3 = .5 and r2.3 = .1.
Calculate SP.

When we have more than 2 securities in a portfolio. we can adopt a different computation method for finding SP. This is explained below:

Note r1.3 = r3,1; r2.3 = r3.2 and so on.

Table = i: The model

	S1	S2	S3
S1	r1,1	r1,2	r1.3
S2	r2,1	r2,2	r2.3
S3	r3,1	r3,2	r3.3

Table = 1: with figures

	S1=5	S2=7	S3=8
S1=5	1	.8	.5
S2=7	.8	1	-.1
S3=8	.5	-.1	1

Table =2: The model

	W1	W2	W3
W1	C1,1	C1,2	C1.3

Table =2 : with figures

	W1=.4	W2=.3	W3=.3
W1=.4	25 (4)	28 (3.36)	20 (2.4)

W2	C2,1	C2,2	C2,3	W2 =.3	28 (3.36)	49 (4.41)	-5.6 (-.504)
W3	C3,1	C3,2	C3,3	W3 =.3	20 (2.4)	-5.6 (-,504)	64 (5.76)

C1,1 = S1 * S1 * r1,1 = 5 * 5 * 1 = 25;
C2,1 = S2 * S1 * r2,1 = 7 * 5 * .8 = 28 and so on.

From table -2, we calculate Wi Wj Ci,j

W1 W1 C1,1 = .4*.4*25 =4; W1 W2 C1,2 = .4*.3*28 = 3.36
W1 W3 C1,3 = .4*.3*20 =2.4; W2 W1 C2,1 = .3*.4*28 = 3.36
W2 W2 C2,2 = .3*.3*49 =4.41; W2 W3 C2,3 = .3*.3*-5.6 = -.504

These figures are available in table-2 itself in brackets and can be done mentally.

So Summ.Summ Wi Wj ri,j Si Sj =Summ.summ Wi Wj Ci,j = 24.682
SP = $(24.682)_{0.5}$ = 4.968 or 5%

Risk describes the quality of return - its ceraintyor otherwise. Given a time series data on the return of a security, its expected (i.e. mean) return and its risk can be computed. Risk is measured by the dispersion or variability in return from the mean or expected return. Generally, standard deviation of return on investment is

taken as the measure of risk, though other measures of dispersion, like quartile deviation, mean deviation, range and coefficient of variation may also be used.

1.2.1.3 Credit rating of debt instruments

Credit rating is a measure of credit risk. A corporate credit rating provides lenders with a simple system of gradation indicating the capacity of borrowers to make timely payment of interest and repayment of principal.

Credit rating has come of age in the Indian Capital market scene. It is being recognised as a significant measure towards investors protection and a self check for the corporate enterprises. Credit rating provides indicative guidance to the prospective investors in fixed income on the degreee of risk involved on the timely payment of principal and interest.

A rated company is highly placed in the estimation of investors than an unrated company. This is irrespective of better financial standing or a reputation attached as a familiar group company of a big business house, of the unrated company.

This makes a transition in the corporate culture in the country. Findings show that, initially companies were shy to opt for credit rating. But gradually the activities of the credit rating agencies have been picking up remarkably.

In India are five credit rating agencies who have been doing the job of assigning ratings to debt instruments of companies, based on wide range of information. The prominent three credit rating agencies are:

1. Credit Rating Information Services of India Ltd. (CRISIL)
2. Investment Information and Credit Rating Agency of India Ltd. (ICRA)
3. Credit Analysis and Research (CARE)

These three credit rating agencies rate the debt instruments/obligations issued by the companies. They rate the credit risk involved in a particular debt instrument.

The types of debt/obligations rated by the three Indian Crdit Rating Agencies are :

1. Long term obligations which are for a period of more than three years like debentures/bonds, preference shares, project finance debt etc.

2. Medium terem debt/obligations ranging from a period of 1 to 3 years like fixed deposit programmes.

3. Short term debt instrument which are repayable within the year. Money market instruments like commercial paper (CP) and certificate of deposits (CDs) come under this category. Commercial paper is a short-term debt obligations of the issuer. The interest rates are freely negotiable. CD is a receipt given to the depositor by a bank for funds deposited with it. Individuals, corporations, trusts, funds, associations, etc. can subscribe to CDs. The maturity period of CDs should be not less than 3 months and not more than 1 yearn It enables cash rich institutions to lend their short term surplus funds of banks. Scheduled commercial banks excluding Regional Rural Banks (RRBs) can issue CDs.

Until 1995, credit rating was confined to debt instruments only. Now slowly rating of equity shares is also being introduced by the credit rating agencies. ICRA has taken up the task of equity rating. But it has to take wings yet.

CREDIT RATING INSTITUTION IN INDIA :

The credit rating Information services of India Ltd. (CRISIL) was set up in January 1988, as India's first rating agency. When CRISIL commenced operations however, not many people were aware of the concept of credit rating. Ratings were not mandatory. Large investors like financial institutions preferred to rely on their in house assessments of the debt repaying capacity of companies, to make their investment decisions. Most of the smaller investors were making their decisions on the basis of the advice given by the brokers. These brokers largely relied on name recognition of the company or the family group controlling it, to decide whether an issue was investment grade or not. However, with the gradual dismantling of entry barriers into industry, new and hitherto unknown enterpreneurs entered the fray. Many established companies found themselves struggling to cope. Some defaulted on their debt obligations, leaving the investor wondering about the safety of his investments. Some of the newer entrants performed remarkably well. This only meant that name recognition too, was no longer enough. At the same time, there was a trend of substantial increase in the investible amounts available with mutual funds promoted by the nationalised banks. These mutual funds had to decide whether to buy, sell or hold certain securities. Credit rating was not their primary business and therefore it made sense for them to supplement their in-house credit analysis with the opinion of a professional rating geency. Thus, the need for the assessment of an unbiased professional rating agency became felt.

In this environment CRISIL identified its immediate objective as follows:

1) to assist investors (both individuals and institutions) in making investment decisions;

2) to assist companies in rasising funds from a wider investor base and at lower costs [for the highly rated companies];

3) to enable banks, investment bankers and brokers in placing debt instruments with investors by providing them with a marketing tool; and

4) to provide regulations for bringing about discipline in, and healthy growth of the capital markets.

CRISIL saw its long term objectives thus:

1) to institutionalise a viable and market driven system of credit rating in India

2) given the less developed nature of the country, to facilitate individuals in investing in financial instruments rather than in non-productive assets.

There objectives of CRISIL's rating strategy was simple

1) Creating awreness of the concepts and the benefits of credit rating

amongst investors, borrowing companies, regulators and market intermediaries,

2) winning the credibility, confidence and trust of its constituents, and

3) generating rating business that would gradually snowball in volumes.

CRISIL in its first 7 years of operation had rated 1310 instruments covering a debt volume of Rs.71,852 crores, as on March 31st , 1995.

When CRISIL poineered the concept of credit rating, in the country, many were sceptical as to the success of the enterprise. But CRISIL has manged to perform well. The company has always covered its costs and has never made an operating loss. This was the position even in the every first quarter of operations, when conditions were undoubtedly difficult.

CRISIL'S success, and the fact that it is endured, has prompted many players to enter the rating game. Their first competitor, the Investment information and Credit Rating Agency (ICRA) prompted by the Industrial Finance Corporation of India, began opertions in September 1991. In 1993, Credit and Research Limited (CARE) another rating agency was set up by the Industrial Development Bank of India. The size of the corporate sector (there are about eight thousand listed companies) justifies the existence of more than one agency.

Investment Information and Credit Rating Agency of India Limited (ICRA)

was set up as an independent and professional credit rating agency promoted by Industrial Finance corporation of INdia jointly wi.h other leading investment institutions, commercial banks and financial service companies.

The primary objective of ICRA is providing guidance to investors/creditors in determining the credit risk associated with a debt instrument/credit obligation. ICRA ratings reflect an independent, professional and impartial assessment of such credit risk. The ratings are enot recommendations to buy, sell or hold the security.

The ICRA rating is a symbolic indicator of the current opinion of the relative capability of timely servicing of debts and obligations by the corporate entity with reference to the instrument rated. The rating is based on an objective analysis of information and clarificaations obtained from the concerns as also other sources which are considered by ICRA to be reliable. ICRA rates long term, medium term and short term debt instruments. Of late it has stepped into the equity rating scene also. During ICRA's first four years of operation they have been ble to rate 494 instruments as at May 31, 1995.

The Reserve Bank of India had granted the Credit Analysis and Research Ltd. (CARE), the status of an approved agency for the purpose of rating issues of commercial paper on 2nd October, 1993. This is another land mark in the world of credit rating agency, which was gradually picking up at that time.

Advent of the third credit rating agency (CARE) was bound to get more than its share of bouquets. When it began to function in the capital market, Credit rating agencies were finally catching up in the minds of investors, banks and financial institutions.

1.3 VARIETIES OF DEBT INSTRUMENTS

Debt instruments are of various types. These are presented below:

We have debentures/bonds, fixed deposits, commercial papers, certificates of deposits, treasury bills, etc. under fixed income category.

1.3.1 Debentures Floated in Domestic Market:

Redeemable debentures/bonds are redeemed, that is, repaid after a aperiod, usually 7-9 years. They have, therefore. definite maturity.

Irredeemable debentures/bonds are perpetual and are repayable by a company only at the time of winding up of the company. These are, therefore almost like equity capital.

Convertible debentures are convertible into equity shares at an agreed price, at or after an agreed period. In an equity culture oriented market, selling straight debentures is difficult. Convertible debentures could be sold easily then.

Non convertible debentures/bonds remain as debentures throughout. There are partly convertible debentures also. Along with conversion, other options like subscribing to shares, etc. may be appended. Then the bonds are known as multiple option convetible bonds.

'Fixed rate bonds carry a fixed coupon, ie. interest rate. Floating rate bonds carry a varying interest rate coupon depending on bank-rate/inflation-rate, etc. These

are actually varying income securities.

Secured debentures/bonds are secured by tangible assets by equitable mortgage or registered charges. Unsecured bonds, also known as naked bonds, do not have any particular claim on any tangible asset.

Registered debentures or debentures whose transfer to new buyers requires a transfer deed to be executed by the transferee in favour of the transferor. Bearer debentures are transferable by mere delivery. They belong to the bearer. Such debentures are not very common.

First mortgage bonds are bonds who have a priority claim on the security given. Second mortgage bonds have only a secondary claim on assets given as security.

Short-term bonds are in currency for a short period, say upto 2 years or so. Long term bonds have life exceeding 2 years or more. The latter are more popular than the former.

Callable bonds can be redeemed prior to their scheduled maturity date by calling them for redemption. The terms of issue should reserve such right for the issuer. Non-callable bonds cannot be called for premature redemption.

Extendable debentures can be extended, ie., their life is extended from one maturity to another maturity dte. In fact they have a series of maturity dates. If these are not presented, for redemption on a particular maturity date, they stand automatically posted for subsequent maturity. The rate of inteerest may be changed.

Non-extendable bonds do not have the above facility.

Collateral bonds are bonds given as additional security to a creditor with the distinct understanding that the bonds shall come to life only in case of default in repayment of the liability. Non-collateral bonds are straight and simple bonds.

Periodicaally amortizing bonds are those that are redeemed peiodically, say monthly, through an EMI (Equated Monthly Instalment) formula. Cumulative bonds are bonds redeemed at the end of the maturity together with accumulated interest.

Debentures with warrants are those issued with warrnats facilitating the holder to apply for prefereential allotment of shares on a later date in return of the warraants. There are deep discount bonds, whose issue price is highly discounted, given the fixed maturity value. No interest is payable in between, however. IDBI had issued such bonds.

Tax-free bonds are bonds, the interest thereon is not taxable. So, the coupon rate is lower than ordinary bonds. Public sector and Govt. bodies generally go for tax-free bonds. Persons in higher tax brckets go for these bond investments.

Direct lien bonds are special bonds secured by one piece of property such as a dock, bridge, etc. If the property is owned by two or more parties, then the bond is called 'joint bond'. A bond with a security of a 'bridge' property as security may be called 'bridge bond' and so on. Prior lien bonds are bonds having a prior claim over even the 1st mortgage bond holders. When a company is taken over, the absorbing company might assume the liability of bonds of the absorbed company. Such bonds are known as assumed or guaranteed bonds. Participatng bonds have a right to get

additional return over and above the fixed coupon if equity dividend exceeds certain predeetermined figure or when EPS exceeds certain figure. Sinking fund bonds are bonds, for the redemption of which a certain sum is periodically drawn from profits and invested outside the business. From sales proceeds of the investments, bonds are redeemed. Serial bonds are bonds with subdivisions posted for serial redemption. Put bonds are redeemable at the option of investor at a price known as strike price.

Finally commercial papers are also debt securities, albeit, short-term in nature.

1.3.2 Bonds Floated in International Capital Market:

Now bonds that are floated in international capital markets are described.

Bonds : For starters, there is a veritable plethora of securities, such as Eurobonds, Yankee bonds, Samurai bonds, and Dragon bonds which tap the European, US, Japanese, and Asoa-Pacific markets, respectively. More specifically, Eurobonds are unsecured debt securities maturing at least a year after the launch. Usually fixed-rate instruments, with bullet repayments - one - shot redemption - these bonds are listed on stock exchanges abroad. And borrowers access global investors with deep pockets. individuals with high net worth as well as institutions.

During 1995, the volume of Eurobond issues from the World's emerging markets hovered around the $ 30-billion mark, with the average size of an issue being $ 127 million. The most popular instrument among emerging market borrowers: a Eurobond with a 144-A tranche. That is, a public offering in the Euro-market and a private offering in the US.

Foreign Commercial Paper: Commercial papers are continuously offered unsecured debt by the borrower. Most FCPs mature in 30 or 60 days and are sold at a discount to their face value. That reflects the interest on the instrument as well as the overall yield to the investor. They are extremely flexible, since commercial papers can be structured according to different maturities, amounts and rates according to the issuer's need for funds.

Fixed/Floating Rate Notes: Instruments for lending for a period of one year to 18 months, fixed notes are better. For longer periods of one to five years, floating rate bonds are better. Again flexibility is the primary benefit: a note can he sold in small tranches, or in larger amounts, with different maturity periods, depending on the conditions in the market and the company's need for funds.

Increasing Rate debt : This debt instrument matures in 90 days' time, but it can be extended at the issuer's option for an additional period at each maturity date, simultaneously, the interest rate also increases. Several variations are possible; extendable bonds and stepped-up coupon puttable bonds. As the term suggests, extendable bonds have fixed redemption dates. However, the investor can choose to hold on to the bond for some more time, usually at a higher coupon rate.

As for **stepped-up coupon puttble bonds**, they are a hybrid between debt with warrants and extendable bonds or notes. After a specified period of time, investors can either put the bonds back up to the issuer or hold on to the bonds for a stated period at a higher-stepped-up-coupon rate.

Flip-Flop Notes: A bond with reverse flexibility. A flip-flop note offers investors the option to convert to another debt instrument. And in some cases,

investors can even go back to the original bond at a later date. The option changes the maturity of the issue and the interest rate profile. It gives issuers the opportunity to pursuade investors to accept lower interest rates, thus reducing their costs. Conversely, investors have options which come in handy when interest rates fluctuate sharply.

Dutch Auction Notes: Here, investors bid for seven-year notes on which the coupon rate is repriced every 35 days. As a result, the notes are sold at the lowerst yield possible. Bids are conducted through a real auction by dealers in the US markets. The main advantage is that these notes provide money for longeer periods than commercial paper, since they are repriced only once every 35 days and, unlike commercial paper, are not redeemed and resold.

Bunny Bonds: These bonds permit investors to deploy their interest income from a host bond into more bonds with the same terms and conditions. Since the option to reinvest interest at the original yield is attractive to long-term investors, like the pension funds.

Euro-rupee Bonds: It doesn't exist yet, but several foreign institutions are toying with the idea of cobbling together such a tool for wary companies. Denominated in rupees, Euro-rupee bonds can be listed in, say, Luxemberg. Interest will be paid out in rupees, and investors play the risks of currency fluctuations.

Euro-Convertible Bonds: These are the most exciting Euro-option available. Equity-linked debt instruments, which can be converted into GDRs. ECBs represent the best of both worlds. And they may soon overtake GDRs in terms of their popularity in this country.

Traditionally, investors have the option to convert any such bonds into equity according to a pre-determined formula-and, appropriately, even at a pre-determined exchange rate. Such bonds allow investors the flexibility to remain with the debt instrument if the share price refuses to rise. These bonds have also spawned subtle variations like those with call and put options, which allow the issuer to insist on conversion beyond certain limits or permit investors to sell the bonds back to the issuer. What's more significant are the structural variations that the Euromarket is becoming famous for.

Deep Discount Convertibles: Such a bond is ususally issued at a price which is 70 to 80 per cent of less its face value. And the initial conversion price, and the coupon rate levels, are lower than that of a conventional Eurobond.

ECBs with Warrants : Strictly speaking, these financial instruments ar nothing but derivatives of Euro-bonds. They are a combination of debt, with the investor getting an option on the issuer's equity. The equity option, or warrant, is detachable from the host bond and it can be cashed after specific points of time. However, the bonds, which have a debt life of seven to 10 years, remain outstanding until they mature. "There can be structural variations, or even derivative products which combine the risk, yield, and expectations of the issuer and the lender". For instance, they could be zero coupon bonds which carry a conversion option at a predetermined price, which are called liquid yield option notes.

Bull Spread Warrants: These warrants offer an investor exposure to the underlying share between a lower level, L, and an upper level, U. The lower level is set to provide a return to investors above the dividend yield on the share. After maturity-usually three years - if the share price is below the level L, then the investor

receives the difference from the company.

Compensating for the downside protection, the issueer can cap the up-side potential on the share. When it matures, if the issuer's share price is above the level U, the issuer has to pay out only the amount U. If the stock is between L and U on maturity, the issuer has a choice of either paying the investor cash or delivering shares. As the minimum return is set above the dividend yield on shares, the structure works best for companies with a low dividend yield.

Money-back warrants (MBWs): MBWs entitle an investor to receive a certain predetermined sum from the issuer provided the investor holds the warrant until it matures, and does not convert it into shares. To the investor, the cost of doing so is not only the cash he loses, but also the interest foregone on that sum of the money. This means that companies must offer a higher premium than they normally do.

Certificate of Deposit is a debt security popular in money market where issuers (mostly banks) issue deposit certificates are discounted values maturing to a specified round sum. **Treasury Bills and Bonds** are issued by the Governments to raise funds. There are 14 day T-Bills, 91 day T-Bills, 361 day T-Bills and dated long term and medium term T-bonds giving fixed yield.

Floating Rate Notes (FRNs): The major drawback of plain vanilla bonds is that they carry a risk of loss from fluctuations is interest rates. Issuers lose when the interest rates drop and subscribers lose when the interest rates rise. The greater the maturity period, the higher is the loss from fluctuations interest rates.

FRNs, which came into existence in the early seventies, eliminate the interest rate risk of plain vanilla bonds since the coupon rate is reset periodically, based on the prevailing interest rates in the market. FRNs have already made their appearance in the Indian market. The SBI was one of the earliest to successfully market these. Recently, the IDBI too used the instrument. The use of FRNs however is still very limited. Complete deregulation of interest rates will given a fillip to FRNs.

Indexed Bonds: These instruments arise from generalisation of the principle underlying FRNs. The first use of indexation was done on government bonds where the coupon rate was linked to the inflation rate or the price of gold. Subsequently, coupon rates have been linked to other indices. An innovation in indexation was done by Guinness Finance in 1986 when it offered stock performance exchange linked (SPEL) bonds with redemption amount linked directly to NHYSE composite index. The bonds therefore offered a surrogate for investing in equity, without the downside.

The major drawback of indexed bonds is that the issuers are exposed to a much higher risk as compared to subscribers since the underlying index can rise substantially. It is therefore not uncommon for the issuers to insure themselves against such a possibility by entering into appropriate arrangement with another financial institution to eliminate its exposure. Of course, there is a cost of such insurance.

SEK (Swedish Export Credit) pioneered an innovative indexed bond when it issued 'Bull and Bear Bonds' in the Japanese market in 1985. These bonds had coupon rates linked to the Nikkei Index. While the coupon rate on the 'Bear' trenche of the bond moved opposite to the index, the coupon rate on the 'Bull' tranche of

the bond moved in line with the index. Since the amount raised through both the tranches was the same, the cost to the company remained the same irrespective of the level of the index.

Through this innovation, the company was not only able to raise money in a difficult market but was also able to bring down its cost of borrowing and eliminate the risk of high cost inherent in indexed bonds. The demand for the Bear tranche of the bond came from Japanese Institutional investors who wanted to hedge their large equity portfolios. The demand for bull tranche came from individual investors who were looking for moderately risky instruments.

Pay-in-kind Bonds: The returns on these bonds are specified in terms of physical quantity of a commodity, such as one kg of sugar per annum on a Rs. 100 paid up bond. The arrangement implies that the issuer would pay the subscribers an amount equal to the price of one kg of sugar every year. Let us examine the utility of these instruments.

An arrangement where returns are linked to price of sugar is of immense value to a sugar producing firm because of the positive correlation between financial costs and revenues. When the sugar price is down and the revenue earned by the firm is low, the financing charge would also be low. The subscribers to such bonds benefit too. They are fully protected against rise in prices of sugar. A family consuming say 50 kg of sugar per year can completely hedge its annual expenditure on sugar by investing Rs. 5,000 in such 'sugar' bonds.

Dual Currency Bonds: These bonds were perhaps first issued in Euromarkets in 1981. The investment is made in one currency and the returns are earned in

another currency. The first few issues of these bonds had the issue price set in Swiss francs and the redemption value in US dollars. Investors who have a very definite view on the movement of exchange rate would be attracted to these bonds. even if the coupon rate on the basis of the prevailing exchange rate is lower than that for straight bonds with identical terms.

In the Indian context these bonds have very interesting implications for both issuers and subscribers. By issuing bonds that have redemption and coupon payment in US dollars (or dollar equivalent) the issuer is implicitly selling the dollars forward. If the issuer is an exporter, then he is implicitly hedging his position against appreciation of the rupee by selling dollars well into the future. Similarly, by subscribing to these bonds, an importer effectively buys dollars forward, thereby hedging against depreciation of the rupee in the future. These bonds are therefore hedging instruments for both importers and exporters, who would respectively subscribe to and issue these bonds.

These bonds also provide retail investors an opportunity to earn dollar returns even in the absence of capital account convertibility. FIIs investing in India would also be attracted to these bonds since the returns are denominated in dollars.

Long Maturity Bonds: The bonds offer in the Indian market typically have 5 to 7 year maturity. There is an urgent need to introduce instruments with longer maturities of say 25 years and above. Such bonds would have ready market with LIC, UTI, several mutual funds, pension and provident funds which have long maturity liabilities and therefore need long maturity instruments to manage the risk of erosion of value from interest rate fluctuations.

These long maturity bonds could either be plain vanilla bonds or deep discount bonds. The deep discount bonds (DDBs) would be particularly appropriate for projects with long gestation periods. The DDEBs offered by IDBI recently are not really long maturity bonds because of the call option available to IDBI every five years.

1.4 DEBT MARKET FEATURES OF INDIA :

Debt market characteristics are presented below:

Fixed income securities are preferred by risk-averse investors. The reasons are not far to seek. They are certain about the periodic return. There is protection of capital. That is, no value depreciation normally takes place. They have the priority to be discharged prior to shareholders. Security, fixed and/or floating charge on the assets of the firm is created to the delight of the investors. Under conditions of stock market depreciation people generally prefer to invest in fixed income securities. Fixed income securities need to be compusorily credit rated. So, investors can know what is the firm-specific risk they take when they invest in these scrips of a concern. Interest received has tax exemptions upto specified amount together with dividend and similar incomes from scrips/deposits. So, cautions investors generally prefer fixed income securities, particularly in a depressed market.

But as fixed income securities lack secondary market, once and for all money is committed to the scrip, until redemption by whatever mode, ie; by maturity, open purchase or by exercising call options. So, fixed income securities lack liquidity and this is a biggest deteriment for investors. Also, if for any reason general rate of interest rises in the market, the fixed income securities carrying fixed and less than

market rate of interest of similar risks, lose their enchantment. Of course, this is now being rectified by the introduction of 'floating rate' debt scrips. Credit rating. though brings to the notice of public firm specific risk, such rating is only relevant for a limited time frame. Nowadays, credit ratings are modified, mostly downgraded very offen. As debt scrips are longer term, the risk the investors take is not known in reality. For these and other reasons fixed income securities have slender demand. And that fixed income securities market is not generally the darling of investors. But, in the doldrum of the equity market, debt market flourishes as is the case in India during 1997-99.

From the point of view issueers of fixed icome securities, there are some merits. Costs both floatation and service, are less than those involved in equity scrips. Second, debt finance has the flexibility of being returned if not needed unlike equity funds. Third, debt securities are the only sound means of raising capital when the equity market is deepressed. Between September 1995 and March 1998, debt securities were floated mostly by firms in India to raise capital in view of the depressed equity market that prevailed during the period. Fourth, interest paid on debt scrips is an allowable deduction from taxation angle. So, the post tax cost of debt secccurities is far reduced. Post tax cost of debt, is given by pre-tax cost multiplied by (1-T), where 'T' is the corporate tax rate. Give pre-tax cost of 14% and T = 40%, post tax cost = 14% (1-40%) = 14% (.6) = 8.4%. Fifth, value of the firm that uses debt capital as against that of another firm of same features but fully equity financed, is higher. Sixth, trading on equity is possible with debt financing. Seventh, dilution of management control does not result when debt dinance is used as fixed income scrips do not have voting rights. Eight, in the case of firms facing inelastic demand for thier products/services, debt capital is good for debt servicing is no problem, since risk of debt financing is off-set by stability of income. Ninth.

debt securities offer variety. Very many modified debt securities like redeemable and irredeemable, convertible and non-convertible, fixed and floting rate, secured and unsecured, registered and bearer, first and second mortgage, shortterm and longterm, callable and non-callable, collateral and non-collateral, extendable and non-extendable, periodically amortizing and cumulative, debts with warrants and without warrants and the like are available. Tenth, legal formalities like (vetting by Securities Exchange Board) are less restrictive.

Thus there are very many advantages from the issuers' point of view to go for more debt financing. But the market for debt securities is not wholely 'supply sided'. The demand side is equally important. Investors preferring debt securities are limited. So, debt market is not big enough than the corporate issuers want it to be, in spite of added sweetness in the form of 'convertibility' and varieties. The 'warrants' carrying debt securities similar to convertible securities have some favour with the investors. As a result of these the use of debt by corporates .pa in India is 1 : 1 with equity, though a 2 : 1 debt equity ratio is considered ideal. Further, some corporates as a policy do not use debt capital. They are satisfied with "all equity" status. Perhaps their EPS is so high, that they do not want to further rise it through the 'trading on equity route'.

Market for debt securities is an important segment of financial security segment. Debt market development is necessary for increasing the popularity of debt instruments. Investors in debt securities should not be left without a secondary market for the securities. The market capitalisation of debt is put at 42% of GDP. In rupee terms it is about Rs.3,50,000 crs. including the internal debt of the Govt. and corporate sector. Such a vast segment, however, has no retail or secondary market. Attempts at creating one such market have been initiated when the National Stock

Exchange was established in 1994. It was primarily meant to increase market for debt securities. And there is increasing concern now in creating a debt market, big and broad in India.

Indresh Batra gives the reasons for this.

The government is now borrowing at market rates. ie. 12% to 13%. Coupled with this, declining returns in equity markets are forcing investors to take closer look at debt. The bearish phase in the market not withstanding, equity markets in India have attained some kind of maturity over a period of time. This will restrict possibilities of super normal returns from equities, therefore restricting opportunities of arbitrage.

Factors on the supply side are also positive. One, the huge infrastructural requirements in future. Since all the projects being sought to be implemented by companies require huge investments and have a long gestation period, they are likely to be financed through debt. This can being about a deepening of the debt market in terms of the number of instruments available. Yet another factor is, those companies planning expansions and diversifications will be chary of a further dilution of their earnings through equity expansion.

They too, are expected to scout the debt market as an option in financing these projects. Recently some companies have shelved thir plans to come out with public equity issues, and are exploring the option of debt market. Also some corporates and PSUs coming out with bond issues are contemplating the merits of tapping the retail investor segment. This decision is being forced by two factors One, the huge demand of the government which has come to the market with ever

increasing yields, sucks out. Liquidity from the market. Second, the gradual lowering of SLR requirements by the RBI, over the years. Due to this, banks and other financial institutions have not been much interested in SLR securities, choosing, instead, to place their money in other high return assets and securities.

Since the proportion of individual investors who invest on their own in the debt market is miniscule, it is through the mutual fund route that they invest in th debt market. Further, it has been seen that those mutual funds which have performed better than the other funds.

This might be due to the sorry state of the equity markets. By their sheer popularity it is clear that there is a big section of investors who are interested in fixed regular returns with very high safety. A case in point is that of JM Mutual Fund which has invested the maximum in the debt portfolio.

Among all its schemes, the liquid fund has performed the best. The major shot in the arm came from the setting of the National Stock Exchange (NSE). After all, all the conditions for the development of the debt market were there, and with the setting up of the NSE in '94, this market took form. Until then, the Bombay Stock Exchange (BSE) was the principal exchange on which corporate debt instruments were listed. But these were hardly traded and quotes were even less indicative. All the trading was through off-market deals.

To boost trading volumes on the exchange, the government directed commercial banks to undertake trading through brokers registeered with the NSE. However, the concept of the screen-based trading has to find acceptance among investors and brokers in the nascent bond market. Both the brokers and market observers point out that deals that are posted on the NSE are actually struck over

the phone. Though this is not to say that the trend of screen-based trading is not picking up.

The other major development in widening the investor base is the difficult task of making the individual investor an active player in this market. has been achieved. After a long wait, the NSE has listed debentures on its capital market segment, hitherto listed on the wholesale market segment. These debentures are 30 in number and have started trading as recently as the first week of August of 1995.This is definitely expected to boost the retial investor's entry into this segment.

In addition, trading on the Bombay On Line Trading (BOLT) system has definitely made trading in debentures easier for the individual. Now, one gets regular quotes of BOLT. Though the percentage of these debentures is small. as compared to the total number of debentures lited, the situation is definiteely changing in favour of the former.

For small investor, it is still more preferable to trade through the OTC exchange. Though the yields here might be lower due to the intermediary interest. there is the much-needed liquidity due to the presence of market makers. Transparency is also one of the major concerns of investors. For now, with all the major exchanges - BSE, NSE and the OTC - dealing in debentures through screen - based trading. investor opportunities have definitely increased.

Rajiv Handa gives further reasons for the growth of debt market in an article. Global debt market form an informal trading arena without there being a requirement to have a built market for trading. The advantage of an official debt market. however. makes settlement and clearing simpler. Since liquidity and an effective secondary

market are of vital importance, the market should be brodbased.

The provident funds have recently been allowed to invest 15 percent of the funds within their ambit in PSU Bonds (Against earlier requirement to keep 70 percent in bank special deposits now only 55 percent would be heenceforth required).

Similarly the RBI has withdrawn the ceiling of 5 percent, placed upon PSU Bond purchases by banks, and additionally allowed banks to invest upto 5 percent of their incremental deposits in provate sector securities. The banks have also been allowed to finance the market makers in debt instruments on a selective basis. These relaxations would add liquidity to the market.

FII's have been allowed to place upto 30 percent of their investible funds in debt istruments. Considering that the FII investment in the stock markets is approximateely $ 2.0 billion, about $600 million could possible go into debt instruments. This would add liquidity to the secondary market. Now even 100% debt investment by FIIs is allowed in dedicated debt funds.

But there are problems. The current low liquidity in the debt market denies an easy exit. This, coupled with non-convertibility of the rupee on capital account would ensure that FIIs abstain. Further, there is non existent standard settlement cycle. And finally, the debt markets are thin, with long-term exposure being no longer than 5-6 years, which makes investing in debt a short-term exercise.

The only factor in their favour is the prevalance of high interest rates in the domestic markets which allow sufficient arbitrage opportunities. Here gain rising interest rates in the West along with rising bond yields, have made emerging markets

less attractive. The problems of currency exposure and withholding tax on interest income are still to be sorted out.

Just like elsewhere, corporates have large surpluses available to them from time to time. These funds are not, per se, parked in debt instruments as alternate investment options have large interest spreads amongst them. While 91 day treasury bills offer a return of 9 percent, inter-corporate deposits can provide as much as 25 to 28 percent for the same tenure. There is not incentive on the part of a corporate investor to thus go in for debt instruments. This is another negation of the debt market within the country.

ICICI former chairman N Vaghul said that reforms in the debt markets were lagging behind the capital market reforms. With industrial growth rate set to be around 10 percent or even more, and different sectors showing divergent growth patterns like steel growing at 8 percent, cement at 8-9 percent and consumer goods a jump of between 40-50 percent, selective sectors would need major capital investments just to keep pace. For instance the power sector would need an investment of over Rs.28,000 crore over the next few years, and so would communications and infrastructure. Corporate cannot live on equity alone in future.

Restrictions on commercial papers need to be removed so that volume of trade in debt instruments picks up. The absence of transparent trading and settlement mechanism is the single most reason for the nondevelopment of a secondary market. There must be cleaar norms for settlement and transfer of bonds acceptable to all players.

Integrated debt and money market work, with the banks, the Central Bank,

the dealer, the buyer and the seller moving in and out of market taking positions all the time creating liquidity in the secondary market and making the interest rate move strictly and essentially on demand and supply factors. The result is that stock and debt markets move together. In their movements they reflect the liquidity in the system, future direction of interest rates and equity yields.

However, while the return on face value is fixed, investors may end up with a high yield as the instrument is sold at a discount to face value in the secondary market. For this reason, avoid primary issues of NCDs and rather pick them up at a discount from the secondary market. This way there would be no loss of capital and yield to maturity would be much higher. Further investors should decide upon their own yield expectations, holding period or tenure, which sit comfortably with their risk exposure.

The outlook on the whole appears promising. For one, volumes will rise in future. With the opening up of NSE, the market activity will pick up as at some stage equity would have to be substituted with debt. Liquidity in the markeet would improve with the arrival of larger players.

Foreign Institutional Investment in dated gilts debt market has been allowed since Nov. 1997. Gayatri Nayak (in ET dt. 12, Nov 1997) observed that:

With the equity markets lying low, thanks to the South Asian currency crisis, allowing foreign institutional investors (FII) - which had suffered losses in Asian stocks - an option to switch their investments up to 30 per cent of the size of their funds from the equities to dated gilts market was a solution to ward off speculative losses and park funds in stable instruments, albeit at a low yield.

But even as the doors to the gilts market was opened in non-dedicated debt FIIs, the experience of opening up the same sector to 100 per cent debt-dedicated FIIs has not been encouraging. And even as the new policy announcements have widened the scope of FII investment in the debt market, the fall in interest rates has served as an disincentive to returns. According to rough estimates, FII participation in the debt market is just about $100 million as against investment of about $9 billion in equity as of out 1997.

Moreover, equity funds first have to make the 70 per cent investment in the equities before they can invest the rest 30 per cent in the debt market. Hence, if the equity market is not attractive at some moment of time, it also deters investment in debt as only by filling the 70 per cent equity cap can the fund put money in gilts.

There is also the question of an choice. FIIs are still not permitted to invest in all segments of the debt market. For instance, they are allowed to invest only in listed securities, corporate bonds and dated securities and not allowed to invest in unlisted securities and treasury bills. To optimise their returns ideally, FIIs feel that they should have been allowed to invest in shorter-maturity treasury bills. This is one of the major factors stopping the FIIs enhancing their investment in the debt markets.

FIIs are not allowed to participate in the money markets as well. For instance, the float fund that arises at the time of repatriation which often lies idle with the bank till income tax issues are cleared, could have fetched more returns had the FIIs have been allowed to invest this money in the money market and earn some returns.

But the withholding tax is seen as one of the major stumbling blocks. Since

the income arising out of these investments also attract 20 per cent with-holding tax, that itself proves to be a major stumbling block for funds to move into the debt market.

Hence, despite a cap of $1 billion, barely a few hundred million dollars have managed to make its way into this market. Says K.R.Bharat, managing director. CS First Boston: "It is simple arithmetic. If we take the case of a `triple A' corporate bond which offers a 14 per cent interest, with the 20 per cent with-holding tax, and about six per cent forward premium, the return is less than what I get on Libor".

Mr. N.Gopalakrishnan, managing director, SBI Gilts, adds: "With-holding tax may not be that big an issue, but removing it will definitely help FIIs to smoothen their operations". Without the withholding tax, debt market seems to have a bright future. K.R.Bharat is very bullish on this front. Says he: "Debt markets in fact will play a more and more important role over the next couple of years. If we look at the goings world over, the amount raised though debt is much higher than the amount raised through equity. At the moment, there are only minor hitches which could be eased out over a period of time".

This is true. And slowly, hitches are being removed. For instance, FIIs are now allowed forward cover for their investment in the debt market. This is likely to become one single factor which will help debt market attract higher capital inflows. Says a Morgan Stanley Asset Management firm official. 'Now that FIIs are allowed to hedge their forex exposure in the forward market, we are likely to see greater inflows into the debt market". Although there are problems, the fact is that a number of changes have taken place in the debt market in the recent past to enthuse investor interest. Besides, relaxation of controls on asset allocation by institutional investors

and interest rates have been deregulated.

Moreover, the government is increasingly resorting to borrowing at market-driven interest rates. Removal of reserve requirements on inter-bank liabilities has paved the way for the creation of a continuous yield curve over the spectrum of maturities. This should lead to greater integration of the government securities market, the corporate bond market and the currency market.

Says Alok Sethi, director, Natwest Markets: "In the long term, as the capital market evolves, there will be more action in the debt market". But, in the short term, he points out that FIIs are using the debt market only to manage temporary liquidity.

FIIs look at the debt markets only when they are not upbeat on the stock market or whenever it has surplus cash. To that extent, the RBI announcement has helped to usher in fleibility in the investments of FIIs. As for the outlook in different markets, a lot has to do with the sentiments of the turns are still perceived to be better in the Indian market than the returns in the developed market. Says Sethi: "In fact, after the Asian currency crisis, the weightage on India has also improved".

The cyclicality in the Indian economy is not in tune with other economies of emerging markets. First, the growth in the emerging economies have been export-led and that's why they have been more susceptible to external shocks. This is not the case with India, where the growth has been more domestic demand driven. There was an investment boom in these economies in the early eighties and that has stopped now. But in India, this investment boom has yet to take place. Hence the outlook on India has improved. Although high risks are attached to the equity market.

the comparable returns are also very high.

While the debt market offers more stable returns, it is still perceived with some uncertainty. What will determine the outlook for the debt market? Says Bhat: “It is the combination of the level of forward premium and the interest rate which will decide the attractiveness of Indian paper. Only if the forward premia settle down at a lower level, combined with a reasonably high level of interest rates, will the returns from the bond market be attractive”.

It is very difficult to predict when such a sustained situation may arise in the Indian markets. That’s one of the reasons why the likes of Morgan Stanley Asset Management still believe that the long-term trend will be one where the equities market will outperform the debt markets. Explains a fund manager, “If we look at the yields from debt and equity for a comparable period, the yield gap has almost narrowed down to zero because interest rates have started moving southwards. Against the current backdrop, it makes more sense for funds to invest in equity rather than debt”. For Indian debt paper to be attractive, analysis feel that the net return at any given point of time should be at least two to three per cent higher for a comparable risk.

Wholesale & retail debt market position was analysed by Mayor Shetty of Mumbai in ET 14th August 1997. The same is presented below.

The secondary debt market at the National Stock Exchange (NSE) has come a long way with volumes in the wholesale debt market (WDM) segment surging in the past few months. In fact, the total volume of trades rose to a historic Rs. 1,553.58 crore on July 17, 1997 a far cry from the volumes of Rs. 70-odd-crore less than a

year ago.

Moreover, the surge in volumes has also seen an increase in the number of securities that were traded in the WDM. According to Ravi Narain, NSE deputy managing director, the volumes are expected to cross the total volumes in equities over a period of time: "Without a doubt volumes in debt will overtake that of equities".

The volumes in the recent past might suggest that the NSE is close to achieving what was initially touted as its raison-d-etre - the creation of a secondary debt market in India.

The NSE which took off on June 1994 was aimed at deepening of the secondary debt market in the country. The NSE was to replace all that with an on-line trading system and an option for negotiated trades which would be reported on the exchange. The WDM has been classified as a 'wholesale segment' as it is characterised by few investors large volumes and high average trade value. It also enabled privately placed debt instruments to be listed, the only requirement being that they should have a minimum investment grade rating.

Unfortunately in the initial two years, the debt market just refused to take off. The show was stolen by the ballooning volumes in the equities segment and the debt market was clearly overshadowed. The recent rise in volumes show signs of revival of the secondary market and there are signs that the NSE debt segment will be the largest secondary market, and in time probably larger than the equity market.

But old problems which inhibited growth persist. Banks rooted in tradition

prefer 'telephone deals' to the on-line trading system. Says Navneet Agarwal, head of origination at Dara Shaw, a firm which trades on behalf of pension funds: "NSE's exercise to convert the exchange from an over-the-counter exchange to an on-line exchange has not been entirely successful". He attributes this to the fact that there is no uniform settlement system.

The boom in volumes, which gives the impression of a developed market, however is still concentrated among same old players. While the market has increased horizontally, with the addition of banks and primary dealers, the customer base remains pretty much the same. These volumes are a spill-over from the unfulfilled demand for government securities at the primary auctions. For instance, the volumes on the WDM segment on July 17, 1997 soared followed an oversubscription of over Rs. 10,000 crore in the government auction of six year paper. The daily average volumes of around Rs. 500 crore, which is much higher than what it was one year ago, is still low compared to the total amount of issuance by the central government. Says M K Khanna, managing director, UTI securities Exchange: "The secondary market has the potential to go up to 20 times to the present volume.

Also lacking in the number of intermediaries, lack of expertise, low brokerage and high stamp duty charges has resulted in only a score of dealers being active on a daily basis compared to total of 112 members possessing a membership card in the debt segment.

The main reasons are again economic. Although the volumes give an impression of size, they are still unremunerative for the brokers. Compared to a commission of .05 per cent in equities, the brokers gets only .01-.02 per cent in government securities. This means that the broker will have to do five times as

much business in gilts as in equities to earn a similar income.

A serious deficiency in the market is the lack of diverse instruments. For one, more than 90 per cent of the debt trade comprises government securities. Trade in corporate debentures even in the best of day represents less than one per cent of the total transactions.

While the NSE is working toward listing of interest rate derivatives, this is still at a very premature stage. The main thrust is still in introducing derivatives like options and future in the equities segment. Say Narain: "There is a strong interest in interest rate derivatives as risk containment and hedging tools are becoming very important among the players". He adds that the NSE has already started doing its homework on this.

Another important test of a vibrant market - which the present market fails - is a two way market. A vibrant market requires players with different views. With banks dominating the scene, the market shas shown itself to be very fickle and the participants have to brace themselves for a change in fortunes at very short notice. But even within the banking sector, the new breed of private sector banks have revolutionised treasury management. Says Kishore Chanker, managing director of ICICI Securities: "Once credit offtake picks up there will be a lot of trading as banks will have to manage their funds much more efficiently".

Chanker says that there will be enough buyers and sellers in the market because the new banks have a different perception from the nationalised banks and follow a higher credit deposit ratio. He says that the more active banks will arbitrage between markets and ensure that there is a high level of trading.

According to Narain, for trading to pick up banks should start taking a view on interest rate for every quarter and shuffle their portfolio accordingly. Market watchers point out that the present market situation could be the best opportunity for deepening of the debt market by encouraging retail interest.

It is with the aim of creating a retail market that the NSE is now developing a retail segment for listing corporate debentures. The segment will have smaller market lots of 50-100 units. "The corporate debentures which are presently listed in the equity segment tend to get lost among all the scripts. Enlisting them in a separate segment will attract retail interest", said an official.

Another problem associated with the development of a real market is that of funds. Several issuers of debt had planned two-way quotes to ensure that a listed security gets traded. However, the brokers are finding a problem in funding their market making activities.

For the development of a retail market it is necessary that these should be a bench-mark for investors to evaluate the returns with varying degrees of riks. According to a report prepared by ICICI Securities, one of the primary dealers, there is a strong case for the marketing of gilts among risk averse individuals. The study shows that over the past three years, investment in government bonds has yielded the highest returns when compared with the BSE sensex and gold prices.

While the BSE has provided only a fractional return of 0.55 per cent, gold has done even worse with investments losing 0.83 per cent over three years. Gilts have returned 11.86 per cent which is still a decent 4.54 per cent over inflation as measured by the wholesale price index.

According to K.Joseph Thomas, head of fixed income at Ceat Financial Services: "There is a very good non-bank market for government securities consisting of provident funds, finance companies and charitable trusts". But this market is not tapped as there is a total lack of information and investors are finding it difficult to source securities.

Thomas however points out that the satellite dealers are unlikely to bring about a dramatic change in volumes as the transactions are likely to be in the range of Rs. 1 lakh. Instead, if the public sector banks trade more actively the volumes are going to rise. "If the SBI whose SLR holding which is in excess of 45,000 crore marks just one per cent of its total portfolio for trading, volumes will shoot up". Thomas says.

Agarwal agrees: "Participants in the money markets in India do not have a trading mentality. World-wide the pension and provident funds and insurance companies are active traders and insurance companies are active traders in the stock exchange". However, in India most of these players, especially the public sector banks, tend to hold their securities till maturity.

According to Thomas, the real boost will come with current account convertibility when insurance companies and pension funds will be allowed to freely invest in the country's debt market.

Some changes are also expected from the Reserve Bank of India. The satellite dealers, who have received in principal approval from the RBI, are yet to receive the go-ahead to commence business. Besides money market mutual funds have not taken off. According to fund managers, many stringent restrictions, particularly the

30-day lock in period, make it difficult for a fund manager to mobilise funds and provide returns.

NSE is doing its bid to develop the market. Last June when the market was still in the doldrums, the National Stock Exchange had set up a standing committee chaired by O.P.Chawla, former director of the National Institute of Bank Management. The committee which included trading members of the NSE - M.K.Khanna of UTI Securities, Jayesh Mehta of DSP Financial Consultants, Mr. Vishnu Deuskar of ABN-Amro Bank and Mr.G.Shiva of Citibank - is looking at key issues including retailing of debt instruments and enhancement of investor base, settlement related issues, procedural issues and infrastructure to facilitate the development of the debt market.

One thorny issue of voucher payment system for government securities has already been resolved with the Union budget doing away with tax deduction at source on government securities. Another issue that is presently being tackled relates to delivery of the securities. The paper-based trading system in debentures is fraught with inefficiency.

As far as the government securities go, the problem does not exist as most of the trades are done though the subsidiary general ledger (SGL) maintained by the RBi. NSE is also proposing to get itself linked to the SGL by being the first corporate member. The proposal which is pending with the finance ministry is expected to come through shortly. This link-up would enable banks and other entities to invest in government securities and hold them in demat form.

The bottle-necks in the secondary market are not new. The challenge for those

interested in the [illegible]er development of the debt market is to sustain the surging volumes in the debt segment. The current spurt should not be allowed to fizzle out.

1.5 DEBT PRICING THEOREMS

According to William J. Sharpe, bond pricing theorems deal with how bond prices move in response to changes in the bonds' yield-to-maturity. Before presenting the theorems, a brief review of some terms associated with bonds are given below for the interest of the learners.

The typical bond is characterized by a promise to pay the investor two types of cash flows. The first involves the payment of a fixed rupee amount periodically (usually carry six months), with the last payment being on a stated date. The second type of cash flows involves the payment of a lump sum on this stated date. The periodic payments are known as **coupon payments**, and the lump-sum payment is known as the bond's principal (or par value or face value). A bond's **coupon rate** is calculated by taking the rupee amount of the coupon payments a bondholder would receive over the course of a year, and dividing this total by the par value of the bond. Finally, the amount of time left until the last promised payment is made is known as the bond's **term-to-maturity**, while the discount rate that makes the present value of all the cash flows equal to the market price of the bond is known as the bond's **yield-to-maturity** (or simply, yield).

Note that if a bond has a market price that is equal to its par value, then its yield-to-maturity will be equal to its coupon rate. However, if the market price is less than par value (a situation where the bond is said to be selling at a discount), then the bond will have a yield-to-maturity that is greater than the coupon rate.

Conversely, if the market price is greater than par value (a situation where the bond is said to be selling at a premium), then the bond will have a yield-to-maturity that is less than the coupon rate.

Theorems

With this in mind, five theorems that deal with bond pricing have been formulated. For case of exposition, it is assumed that there is one coupon payment per year (that is, coupon payments are made every 12 months). The theorems are as follows:

1. If a bond's market price increases, then its yield must decrease; conversely, if a bond's market price decreases, then its yield must increase.

   As an example, consider bond A, which has a life of five years, a par value of Rs.1,000, and pays coupons annually of Rs.80. Its yield is 8% because it is currently selling for Rs.1,000. However, if its price increases to Rs.1,100, then its yield will fall to 5.76%. Conversely, if its price falls to Rs.900, then its yield will rise to 10.68%.

2. If a bond's yield does not change over its life, then the size of its discount or premium will decrease as its life gets shorter.

   This can be seen by examining Figure.1.1. The price of a bond that is selling at either a premium or a discount today will converge over time to its par value. Ultimately the premium or discount will completely

disappear at the maturity date.

As an example, consider bond B, which has a life of five years, has a par value of Rs.1,000, and pays coupons annually of Rs.60. Its current market price is $883.31, indicating that it has a yield of 9%. After one year, if it still has a yield of 9%, it will be selling for Rs.902.81. Thus its discount has decreased from Rs.116.69 (= Rs.1,000 - Rs.888.31) to Rs.97.19 (= Rs.1,000 - Rs.902.81), for a change of Rs.19.50 (= Rs.116.69 - Rs.97.19).

An equivalent interpretation of this theorem is that if two bonds have the same coupon rate, par value, and yield, then the one with the shorter life will sell for a smaller discount or premium. Consider two bonds, one with a life of five years and the other with a life of four years. Both bonds have a par value of Rs.1,000, pay annual coupons of Rs.60, and yield 9%. In this situation, the one with a five-year life has a discount of Rs.116.69, whereas the one with a four-year life has a smaller discount of Rs.97.19.

3. If a bond's yield does not change over its life, then the size of its discount or premium will decrease at an increasing rate as its life gets shorter.

Figure.1.2 can also be used to illustrate this theorem. Note how the size of the premium or discount does not change much at first when time passes from today to tomorrow. In contrast, the size changes much more notably when time passes just before the maturity date.

As an example, consider bond B again. After two years, if it still has a yield of 9%, it will be selling for Rs.924.06. Thus its discount has increased to Rs.75.94 (= Rs.1,000 - Rs.924.06). Now the amount of the change in the discount from five years to four years was Rs.19.50 (= Rs.116.90 - Rs.97.19) for a percentage change from par of 1.950%. However, the amount of the change from four years to three years is larger, going from Rs.97.19 to Rs.75.94 for a dollar change of Rs.21.25 and a percentage change from par of 2.125%.

4. A decrease in a bond's yield will raise the bond's price by an amount that is greater in size than the corresponding fall in the bond's price that would occur if there were an equal-sized increase in the bond's yield.

As an example, consider bond C, which has a life of five years and a coupon rate of 7%. Because it is currently selling at its par value of $1,000, its yield is 7%. If its yield rises by 1% to 8%, then it will be selling for Rs.960.07, a change of Rs.9.93. Alternatively, if its yield falls by 1% to 6%, then it will be selling for Rs.1,042.12, a change of Rs.42.12, which is of greater magnitude than the Rs.39.93 associated with the 1% rise in the bond's yield.

5. The percentage change in a bond's price owing to a change in its yield will be smaller if its coupon rate is higher. (Note: This theorem does not apply to bonds with a life of one year or to bonds that have no maturity date, known as consols of perpetuities).

As an example, compare bond D with bond C. Bond D has a coupon rate of

9%, which is 2% larger than C's. However, bond D has the same life (five years) and yield (7%) as C. Thus D's current market price is Rs.1,082.00. Now if the yield on both C and D increases to 8%, then their prices will be Rs.960.07 and Rs.1,039.93, respectively. This represents a decrease in the price of C equal to Rs.39.93 (= Rs.1,000 - Rs.960.07), or 3.993%. (Note: 3.993% = Rs.39.93/Rs.1,000). For D, the decrease in price is equal to Rs.42.07 (= Rs.1,082 - Rs.1,039.93), or 3.889%. (Note: 3.889% = Rs.42.07/Rs.1,082). Because D had the higher coupon rate, it has the smaller percentage change in Mprice.

It is important for a bond analyst to understand these properties of bond prices thoroughly because they are valuable in forecasting how bond prices will respond to changes in interest rates.

1.6 CONVEXITY

The first and fourth bond pricing theorems have led to the concept in bond valuation known as **convexity**. Consider what happens to the price of a bond if its yield increases or decreases. According to Theorem 1, bond prices and yields are inversely related. However, this relationship is not linear, according to Theorem 4. The size of the rise in a bond's price associated with a given decrease in its yield is greater than the drop in the bond's price for a similar-sized increase in the bond's yield.

This can be seen by examining Figure 1.3. The current yield-to-maturity and the price for the bond are denoted by P and y, respectively. Consider what would happen to the bond's price if the yield increased or decreased by a fixed amount (for example, 1%), denoted y+ and y-. The associated bond prices are denoted by P- and

P+, respectively.

Two observations can be made by examining the figure. First, an increase in the yield to y+ is associated with a drop in the bond's price to P-, and a decrease in the yield to y- is associated with a rise in the bond's price to P+. This is in accord with the first bond theorem. (Hence the symbols + and - are paired inversely so that, for example, y+ is associated with P-). Second, note that the size of the rise in the bond's price (P+ - P) is greater than the size of the drop in the bond's price (P - P-). This is in accord with the fourth bond theorem.

The curved line in the figure that shows the relationship between bond prices and yield is convex because it opens upward. Accordingly, the relationship is frequently referred to as convexity. Although this relationship is true for standard types of bonds, it should be mentioned that the degree of curvature (or convexity) is not same for all bonds. Instead, it depends on, among other things, the size of the coupon payments, the life of the bond, and its current market price.

1.7 DURATION

According to William J.Sharpe, **duration** is a measure of the "average maturity" of the stream of payments associated with a bond. More specifically, it is a weighted average of the lengths of time until the remaining payments are made. Consider, For example, a bond with annual coupon payments of Rs.80, a remaining life of three years, and a par value of Rs.1,000. Because it has a current market price of Rs.950.25, it has a yield-to-maturity of 10.00%. As shown in Table, its duration is 2.78 years. Note that this is calculated by taking the present value of each cash flow, multiplying each one by the respective amount of time until it is received,

summing the resulting figures, and then dividing this sum (Rs.2,639.17) by the market price of the bond (Rs.950.25).

The Formula

Specifically, the formula for a bond's duration, D, is:

$$D = \frac{\sum_{t=1}^{T} PV(C1) \times t}{P0}$$

TABLE 1.1
CALCULATION OF DURATION

Time until Receipt of Cash Flow	Amount of Cash Flow	Present Value Factor	Present Value of Cash Flow	Present Value of Cash Flow x Time
1	Rs. 80	.9091	Rs. 72.73	Rs. 72.73
2	80	.8264	66.12	132.23
3	1,080	.7513	811.40	2,434.21
			Rs.950.25	Rs.2,639.17

$$\text{Duration} = \frac{\text{Rs.}2{,}639.17}{\text{Rs.}950.25} = 2.78 \text{ years}$$

where PV(C1) denotes the present value of the cash flow to be received at time t, calculated using a discount rate equal to the bond's yield-to-maturity: P0 denotes the current market price of the bond; and T denotes the bond's remaining life.

Why is duration thought of as the "average maturity of the stream of payments associated with a bond"? This can be seen by realizing that the current market price of the bond, P0, is equal to the sum of the present values of the cash flows. PV(C1), where the discount rate is the bond's yield-to-maturity.

$$P0 = \sum_{t=1}^{T} PV(C1)$$

Thus there is an equivalent method for calculating a bond's duration that can be seen by rewriting Equation in a slightly different manner.

$$D = \sum_{t=1}^{T} \frac{PV(C1)}{P0} \times t$$

First, the present value of each cash flow, PV(C1), is expressed as a proportion of the market price P0. Second, these proportions are multiplied by the respective amount of time until the cash flows are received. Third, these figures are summed, with the sum being equal to the bond's duration.

In the example shown in Table 1.1, note that 0.07653 (= Rs.72.73/Rs.950.25) of the bond's market price is to be received in one year. Similarly, 0.06958 (=

Rs.66.12/Rs.950.25) is to be received in two years, and 0.85388 (= Rs.811.40/ Rs.950.25) is to be received in three years. Note how these proportions sum to 1, which means that they can be interpreted as weights in calculating a weighted average. Thus to calculate the average maturity of the payments associated with a bond, each weight needs to be multiplied by the respective amount of time until the corresponding cash flow is to be received, and then the products need to be summed: (1 x .07653) + (2 x .06958) + (3 x .85388) = 2.78 years.

Note how a zero coupon bond will have a duration equal to its remaining life T because there is only one cash flow associated with such a bond - that is, because P0 = PV(CT) for such bonds, Equation reduces to

$$D = \frac{PV(CT)}{P0} \times T$$

For any coupon-bearing bond its duration will always be less than the amount of time to its maturity date T. Again, examination of Equation indicates why this is so. Because the largest value that t can have is T, and each value of t is multiplied by a weight equal to PV(C1)/P0, it follows that must be less than T.

1.7.1 Relationship between Convexity and Duration

At this point is useful to consider just what kind of relationship the concepts of convexity and duration have to each other. After all, both have something to do with measuring the association of the change in a bond's price with a change in the bond's yield-to-maturity. Figure shows the nature of the relationship. Like Figure, this figure represents a bond that is currently selling for P and has a yield-to-maturity

of y. Note the straight line that is tangent to the curve at the point associated with the current price and yield.

If the bond's yield increases to y+, then the associated price of the bond will fall to P-. Conversely, if the bond's yield decreases to y-, then the associated price of the bond will rise to P+. However, by using Equation, the estimated prices will be P-D and P+D, respectively. This is because the equation, as mentioned earlier, is not exact. Instead, it is an approximation that states that the percentage change in the bond's price is a linear function of its duration. Hence the equation approximates the new price in a linear fashion represented by the straight line and leading to an error that is a consequence of convexity. [In the example, the sizes of the respective errors are (P- - P-D) and (P+ - P+D)]. That is, because the relationship between yield changes and bond price changes is convex, not linear, the use of equation will underestimate the new price associated with either an increase or a decrease in the bond's yield. However, for small changes in yields the error is relatively small, and thus, as an approximation, the equation works reasonably well. This can be seen by observing in Figure that the size of the pricing error becomes smaller as the size of the yield change gets smaller. (Note that the distance between the linear approximating line and the convex curve will be smaller for smaller changes in yields from y).

1.8 RISK-RETURN STRUCTURE

Risk and return are expected to be directly proportional.

Debt securities are classified on the basis of default risk as AAA, AA, A, BBB, BB, B, C & D in respect of long term corporate debts. This classification

adopted by premier credit rating agencies in India are given below.

RATING SYMBOLS AND THEIR MEANING AS GIVEN BY THE THREE RATING AGENCIES, CRISIL, ICRA, CARE

DEBT INSTRUMENT	CATEGORY	DEBT	RATING SYMBOLS		REMARKS
			CRISIL	ICRA	CARE
Long term Instrument	Debentures, bonds and Preference	AAA	LAAA	CARE-AAA	Highest safety
		AA	'LAA	'CARE-AA	High safety
			shares	'A	'LA'CARE-A
			Adequate safety		
		'BBB	'LBBB	'CARE-BBB	Moderate safety
		'BB	'LBB	'CARE-BB	Inadequate safety
		'B	'LB	'CARE-B	Risk Prone
		'C	'LC	'CARE-C	Substantial risk
		'D	'LD	'CARE-D	Default
Medium term Instrument	Fixed deposits	FAAA	MAAA	CARE-AAA	[FD]/[CD]/[SO]' Highest safety as the case may be.
		'FAA	'MAA	'CARE-AA	[FD]/[CD] [SO] High safety as the case may be.
		'FA	'MA	'CARE-A	[FD]/[CD] [SO] Adequate safety as the case may be.
		'FB	'MB	'CARE-BBB	[FD]/[CD]/[SO] Inadequate safety as the case may be.
				'CARE-BB	[FD] [CD] [SO] Inadequate safety as the case may be.
				'CARE-B	[FD] [CD] [SO] Inadequaate safety as the case may be.
		'FC	'MC	'CARE-C	[FD] [CD] [SO] Risk prone as the case may be.

				'FD	'MD	'CARE-D	[FD]/[CD]/[SO] Default as the case may be.
Short term	Commercial paper Instrument	'P1	'A1	'FR-1			Highest safety
		'P2	'A2	'PR-2			High safety
		'P3	'A3	'PR-3			Adequate safety
		'P4	'A4	'PR-4			Risk prone
		'P5	'A5	'PR-5			Default

* The suffix of + [plus] or - [minus] signs are used with the rating symbols to indicate the comparativee positions of the instrument within the group covered by the symbol.

** FD - Fixed Deposit

CD - Certificate Deposit

SO - Structured Obligations.

Default rates of U.S.Bonds during the period 1971-90 were studied by Edward I.Altman and the same are presented by bond classification.

TABLE

DEFAULT RATES OF U.S.BONDS, 1971-1990

Years After Issuance	Original Rating						
	AAA	AA	A	BBB	BB	B	CCC
1	.00%	.00%	.00%	.03%	.00%	.87%	1.31%
2	.00	.00	.30	.57	.93	3.22	4.00
3	.00	1.11	.60	.85	1.36	9.41	19.72
4	.00	1.42	.65	1.34	3.98	16.37	36.67

5	.00	1.70	.65	1.54	5.93	20.87	38.08
6	.14	1.70	.73	1.81	7.38	26.48	40.58
7	.19	1.91	.87	2.70	10.91	29.62	NA
8	.19	1.93	.94	2.83	10.91	31.74	NA
9	.19	2.01	1.28	2.99	10.91	39.38	NA
10	19	2.11	1.28	3.85	13.86	40.86	NA

Source: Edward I.Alman, "Defaults and Returns on High-Yield Bonds Through the First Half of 1991", Financial Analysis Journal, 47, no.6 (November/December 1991):

As risk varied with bonds, return also varies. Traditionally, a risky bond's expected yield-to-maturity is compared with that of a default-free bond of similar maturity and coupon rate. The difference between these yields is known as the bond's **risk premium**.

Every bond that might default will offer a default premium. But the risk premium is another matter. Any security's expected return should be related only to its systematic risk, for it is this risk that measures its contribution to the risk of a well-diversified portfolio; its total risk is not directly relevant.

For example, if a group of companies all faced the possibility of bankruptcy, but from totally unrelated causes, a portfolio that included all of their bonds would subsequently provide an actual return very close to its expected return. This is because the default premiums earned on the bonds that did not default would offset the losses incurred from those bonds that did default. Consequently, there should be little reason for this expected return to differ significantly from that of a default-

free bond, because there is little doubt concerning what its actual return will be.

The greater a bond's risk of default, the greater its default premium. This alone will cause a bond with a higher default risk to offer a higher promised yield-to-maturity. If it is also true that the greater a bond's risk of default, the greater its risk premium, then the promised yield-to-maturity will have to be even higher. As a result, bonds given lower agency ratings should have higher promised yields-to-maturity if such ratings really do reflect the risk of default.

Figure shows that this is indeed in the case. Each of the curves plots the promised yield-to-maturity for a group of corporate bonds assigned the same ratings by Moody's. Note that the scale is "upside down", so that higher promised yields plot at lower positions on the diagram. (Such a procedure is often employed for bonds).

Figure shows not only that bonds are priced so that higher promised yield go with lower ratings, it also shows that the differences between the yields in the rating categories vary considerably over time. This suggests that agency ratings indicate relative levels of risk instead of absolute levels of risk.

If an absolute level of risk were indicated by a rating classification, then each classification would be associated with a particular probability of default (or, more accurately, a range of probabilities of default). Consequently, as the economy became more uncertain in terms of such factors as the near-term level of gross domestic product, bonds would be reclassified, with most moving to lower ratings. In this situation, yield spreads between classifications would change only slightly, as each classification would still reflect bonds having the same probability of default.

However, Figure shows that these spreads change over time, an observation that can be interpreted as evidence that the ratings do not reflect absolute levels of risk.

As mentioned previously, when bond analysts refer to a corporate bond's yield spread, they are typically referring to the difference between the corporate bond's promised yield-to-maturity and that of another bond (often a Treasury security) having a similar maturity and coupon rate. The greater the risk of default, the greater this spread should be.

A study on yield spread established the following equation:

$$\begin{aligned}\text{Yield spread} = \; & .487 + .307 \text{ earnings variability} \\ & -.253 \text{ (time without default)} \\ & -.537 \text{ (equity/debt ratio)} \\ & -.275 \text{ (market value of debt)}\end{aligned}$$

This form of the relationship accounted for roughly 75% of the variation in the bonds` yield spreads.

The advantage of an equation such as this is that the coefficients can be easily interpreted. Because all yield spreads and values had been converted to logarithms, the effect is similar to that of using ratio scales on all axes of a diagram. This means that a 1% increase in a bond's earnings variability can be expected to bring about an increase of .307% in the bond's yield spread, other things being equal. Similarly, a 1% increase in a bond's time without default can be expected to cause a decrease of approximately **.253%** in the bond's yield spread, and so on. Each coefficient is an elasticity, indicating the percentage change in a bond's yield spread likely to

accompany a 1% change in the associated measure. As every measure was found to be related in the expected direction to the yield spread, the study provides substantial support for the notion that bonds with higher default risk and less marketability have higher yield spreads.

QUESTIONS

1. Given an account and importance of debt market.
2. Present the nature of debt instruments.
3. Present the different types of debt instruments.
4. Present a classification of debt instruments by fixidity or otherwise of return, by risk class, by convertibility or otherwise.
5. Explain the primary and secondary debt market in India.
6. Explain the wholesale debt market in India.
7. How do you analyse the return and risk of debt market instruments.
8. Make out a case for strong secondary market for debt in India.
9. Explain broad features of debt market in India.
10. Explain debt pricing theorems.
11. Explain the concept of convexity and its measure and merits.
12. What is duration? Explain its measure and merits.
13. Present relationship between risk-return in the context of bond market.
14. Calculate the discussion of a 3 year bond with face value = Rs.1000, a coupon of 7% p.a. and given YTM = 6% p.a.

REFERENCES

1. Investments : William Sharpe, Godon J, Alexandar & Jeffery V. Bailey.
2. Economic Times (ET): 12, Nov 1997 (Article), Gayatri Nayak.
3. Economic Times (ET): 14, Aug 1997 (Article), Mayur Shetty.
4. Economic Times (ET): 1, Jul 1996 (Article), Samir K.Barua.
5. Alagappa University, DDE study materials - Debt & Equity Market, Dr.M.Selvam.
6. Alagappa University, DDE study materials - Investment Analysis, Dr.M.Selvam.

UNIT II : DEBT PORTFOLIO MANAGEMENT

In this lesson concept and importance of debt portfolio management, types of debt portfolio (passive immunization and active management), horizon analysis and bond swaps are dealt with.

2.1 CONCEPT OF DEBT PORTFOLIO MANAGEMENT

Portfolio is a collection of investments. Portfolio of investment, if well constructed and chosen, helps in reducing risk and maximising return. (For more details on concept of portfolio refer to study materials for Paper III: Portfolio Management).

The methods currently in use for managing bond portfolios can be divided into two general categories - passive and active. Methods in the passive category rest on the basic assumption that bond markets are semistrong-form efficient - that is, current bond prices are viewed as accurately reflecting all publicly available information. Thus bonds are felt to be priced fairly in the marketplace, providing a return that is commensurate with the risk involved. In addition to believing that individual bonds are not mispriced, passive investors also believe that attempting to predict interest rates is, in general, futile. In summary, passive management rests on the belief that attempts at both security selection (that is, identifying mispriced bonds) and market timing (for example, buying long-term bonds when interest rates are predicted to fall and replacing them with short-term bonds when interest rates are predicted to rise) will be unsuccessful in providing the investor with above-average returns.

Active methods of bond portfolio management are based on the assumption that the bond market is not so efficient, thereby giving some investors the opportunity to earn above-average returns. That is, active management is based on the ability of the portfolio manager either to identify mispriced bonds or to "time" the bond market by accurately predicting interest rates.

2.2 IMPORTANCE OF DEBT PORTFOLIO MANAGEMENT

Debt portfolio management has its own importance. Choice of debt instruments for inclusion and exclusion in the portfolio and market timing of inclusion and exclusion of different instruments in the debt portfolio are two crucial issues that determine debt portfolio complexion in terms of return and risk. Effective debt portfolio management is needed to maximise yield and minimise risk. The too many debt securities available in the market, though good, is making problem of choice difficult. A typical case of problem of plentiness!

Tracking of individual debt securities, forecasting of interest rates, predicting tax sops or levies affecting debt instruments, forecasting default risk and default premium levels, predicting linkages between equity and debt markets, as one eats into the other, etc are the tasks involved to get one-self armed to construct/alter debt portfolios. Active management would require even more involvement in the analysis of the debt market options. The purpose of all this, is to spread unsystematic risk away and maximise yield. Hence the importance of debt portfolio management.

2.3 PASSIVE IMMUNIZATION

The introduction of the concept of duration led to the development of the

technique of bond portfolio management known as immunization. Specifically, this technique allegedly allows a bond portfolio manager to be relatively certain of being able to meet a given promised stream of cash outflows. Thus once the portfolio has been formed, it is "immunized" from any adverse effects associated with future changes in interest rates.

2.3.1 HOW IMMUNIZATION IS ACCOMPLISHED

Immunization is accomplished simply by calculating the duration of the promised outflows and then investing in a portfolio of bonds that has an identical duration. In doing so, this technique takes advantage of the observation that the duration of a portfolio of bonds is equal to the weighted average of the durations of the individual bonds in the portfolio. For example, if a portfolio has one-third of its funds invested in bonds having a duration of six years and two-thirds in bonds having a duration of three years, then the portfolio itself has a duration of four years [= (1/2 x 6) + (2/3 x 3)].

Consider a simple situation where a portfolio manager has one and only one cash outflow to make from his or her portfolio - an amount equal to Rs.1,000,000, which is to be paid in two years. Because there is only one cash outflow, its duration is simply two years. Now the bond portfolio manager is considering investing in two different bond issues. The first bond issue is the one shown in Table. (refer Unit I, Section to 7) where the bonds have a maturity of three years and duration of 2.78 years. The second bond issue involves a set of bonds that mature in one year, providing the holder of each bond with a single payment of Rs.1,070 (consisting of a single coupon payment of Rs.70 and a par value of Rs.1,000). As these bonds are currently selling for Rs.972.73, their yield-to-maturity is 10%.

Consider the choices open to the portfolio manager. All of the portfolio's funds could be invested in the one-year bonds, with the notion of reinvesting the proceeds from the maturing bonds one year from now in another one-year issue. However, doing so would entail risks. In particular, if interest rates were to decline over the next year, then the funds from the maturing one-year bonds would have to be reinvested at a lower rate than the currently available 10%. Thus the portfolio manager faces reinvestment-rate risk owing to the possibility that the funds one year from now could be reinvested only at a lower rate.

A second alternative would be for the portfolio manager to invest all of the funds in the three-year issue. However, this also entails risks. In particular, the three-year bonds will have to be sold after two years in order to come up with the Rs.1,000,000. The risk is that interest rates will have risen before then, meaning that bond prices, in general, will have fallen and the bonds will not have a selling price that is at least Rs.1,000,000. Thus the portfolio manager faces interest-rate risk with this strategy.

One proposed solution is to invest part of the portfolio's funds in the one-year bonds and the rest in the three-year bonds. How much should be placed in each issue? If immunization is to be used, the solution can be found by solving simultaneously a set of two equations involving two unknowns.

$$W_1 + W_3 = 1$$
$$(W_1 \times 1) + (W_3 \times 2.78) = 2$$

Here W_1 and W_3 denote the weights (or proportions) of the portfolio's funds that are to be invested in the bonds with maturities of one and three years, respectively.

Note how Equation states that the sum of the weights must equal to 1, whereas Equation states that the weighted average of the durations of the bonds in the portfolio must equal the duration of the cash outflow, which is two years.

The solution to these two equations is easily found. First Equation is rewritten as:

$$W_1 = 1 - W_3$$

Then $1 - W_3$ is substituted for W_1 in Equation, resulting in

$$[(1 - W_3) \times 1.0] + (W_3 \times 2.78) = 2$$

i.e $1 - W_3 + 2.78\ W_3 = 2;\ 1.78\ W_3 = 1;\ W_3 = 0.5618.$

As this is'one equation with one unknown, W_3, it is solved easily. Doing so results in $W_3 = .5618$. Inserting this value into Equation indicates that $W_1 = .4382$. Thus the portfolio manager should put 43.82% of the portfolio's funds in the one-year bonds and 56.18% in the three-year bonds.

In this case, the portfolio manager would need Rs.826,446 [= Rs.1,000,000/ $(1.10)^2$] in order to purchase bonds that would create a fully immunized portfolio. With this money, Rs.362,149 (= .4382 x Rs.826,446) would be used to buy one-year bonds and Rs.362,297 (= .5618 x Rs.826,446) would be used to buy three-year bonds. Because the current market prices of the one-year and three-year bonds are Rs.972.73 and Rs.950.25, respectively, this means that 372 one-year bonds (=Rs.362,149 / Rs.972.73) and 489 three-year bonds (=Rs.464,297 / Rs.950.25) would be purchased.

What does immunization accomplish? According to theory, if yields rise, then the portfolio's losses owing to the selling of the three-year bonds at a discount after two years will be exactly offset by the gains from reinvesting the maturing one-year bonds (and first-year coupons on the three-year bonds) at the higher rate. Alternatively, if yields fall, then the loss from being able to reinvest the maturing one-year bonds (and first-year coupons on the three-year bonds) at a lower rate will be exactly offset by being able to sell the three-year bonds after two years at a premium. Thus the portfolio is immunized from the effect of any movements in interest rates in the future.

Table 2.1 shows more explicitly what would happen to the portfolio. The second column shows what the portfolio would be worth at the end of two years if yields remained at 10% over the next two years. As can be seen, the value of the portfolio of one-year and three-year bonds would be approximately equal to the promised cash outflow of Rs.1,000,000. Alternatively, if yields fell to 9% or rose to 11% before one year had passed and remained at the new level, then the value of the portfolio would be slightly more than the needed Rs.1,000,000.

2.4 ACTIVE MANAGEMENT

As mentioned earlier, active management of a bond portfolio is based on the belief that the bond market is not perfectly efficient. Such management can involve security selection, where attempts are made at identifying mispriced bonds. Alternatively, it can involve market timing, where attempts are made at forecasting general movements in interest rates. It is also possible for an active portfolio manager to be involved in both security selection and market timing. Although there are a large number of methods of actively managing a bond portfolio, some general types

of active management can be described.

A part of active management is riding the yield curve, And the same is explained below.

This method of bond portfolio management is sometimes used by people who, having liquidity as a primary objective, invest in short-term fixed-income securities. One way of investing is to simply purchase these securities and hold them until they mature, and then reinvest the proceeds. An alternative way is to ride the yield curve, provided that certain conditions exist.

One condition is that the yield curve be upward sloping, indicating that longer term securities have higher yields them short term bonds. Another condition is that the investor believe that the yield curve will remain upward sloping. Given these two conditions, the investor who is riding the yield curve will purchase securities that have a somewhat longer term-to-maturity than desired, and then sell them before they mature, thereby capturing some capital gains.

For example, consider an investor who prefers investing in 90-day Treasury bills. Currently such bills are selling for Rs.98.25 per Rs.100 of face value, indicating that they have a yield of 7.00% [note that Rs.98.25 = Rs.100 - (7.00 x 90/360)]. However, 180-day Treasury bills are currently selling for Rs.96.00, indicating that they have a higher yield of 8.00%. [note that Rs.96 = Rs.100 - (8.+00 x 180/360)]. Given that this investor believes that the yield curve will remain upward sloping over the next three months, it can be shown that riding the yield curve will result in a higher return than simply buying and holding the 90-day Treasury bills.

If the investor buys and holds the 90-day Treasury bills, then the resulting annualized rate of return will be:

$$\frac{Rs.100 - Rs.98.25}{Rs.98.25} \times \frac{365}{90}$$

which is 7.22%. Alternatively, if the investor buys the 180-day Treasury bills and subsequently sells them after 90 days, then the expected selling price will be $98.25. (Note that this is the same as the current price of 90-day bills, because it is assumed that the yield curve will not have changed after 90 days have elapsed). This means that the expected return is:

$$\frac{Rs.98.25 - Rs.96.00}{Rs.96.00} \times \frac{365}{90}$$

which is 9.50%. In comparison, the expected return from riding the yield curve is higher. This is because the investor expects to benefit from a decline in yield, a decline that does not result from a shift in the yield curve but is attributable to the shortening of the maturity of the 180-day Treasury bills that were initially purchased.

It should be kept in mind that if the yield curve does change, then "riding it" might be detrimental to the investor's return. That is, riding the yield yield curve has more risk than simply buying securities that mature at the appropriate time. Similarly, there are two transactions necessary (buying and then selling the security) when riding the yield curve, whereas a maturity strategy has only one transaction

(buying the security). Thus there are going to be larger transaction costs associated with riding the yield curve.

2.5 HORIZON ANALYSIS

The return on a bond over any given holding period, sometimes referred to as the bond's realized return, depends on its price at the beginning of the period and its price at the end of the period, as well as on its coupon rate. Thus the return on a bond over a one-year holding period will depend on the yield structure at the end of the year, as the price of the bond at these two points in time will depend on these structures. It follows that possible subsequent changes to the beginning-of-period yield structure must be analyzed in order to estimate possible bond returns over a given holding period. Bond portfolio managers who believe that they are able to identify such changes will want to translate their beliefs into action.

One way of doing this is known as **horizon analysis**, where a single holding period is selected for analysis and possible yield structures at the end of the period (that is, at the "horizon") are considered. The possible returns for two bonds - one currently held and one candidate to replace it - are then analyzed. In doing so, neither bond is assumed to default up to the horizon date. In the process of the analysis, the sensitivities of the returns to changes in key assumptions regarding yields are estimated, allowing at least a rough assessment of some of the relevant risks.

Horizon analysis can be viewed as another way of implementing the capitalization of income method of valuation. By focusing on the estimated end-of-period price of a bond, it seeks to determine whether the current market price is

relatively high or low. That is, for a given estimated end-of-period price, a bond will have a relatively high expected return if its current price is relatively low. Conversely, a bond will have a relatively low expected return if its current price is relatively high.

Figure 2.1 represents a page from a standard yield book for bonds with a 4% coupon. As indicated, a 4% bond with ten years remaining to maturity that is currently priced at Rs.67.48 (for case of exposition, a par of $100 is used here) will have a 9% promised annual yield-to-maturity (or 4.5% semiannually). Five years into the future, such a bond's term-to-maturity will have decreased, and the relevant promised yield-to-maturity will probably have changed. Thus as time passes, the bond might follow a path "through the table" such as that shown by the dashed line. If so, it would end up at a price of Rs.83.78 at the horizon (five years hence) with an 8% promised annual yield-to-maturity (or 4% semiannually).

Over any holding period, a bond's return will typically be affected by both the passage of time and a change in yield. Horizon analysis breaks this into two parts: one owing solely to the passage of time, whereby the bond's price moves toward the par value to be paid at maturity (assuming no change in yield), and the other owing solely to a change in yield (assuming no passage of time). The total price change from Rs.67.48 to Rs.83.78 (or Rs.16.30) is broken into a change from Rs.67.48 to Rs.80.22 (or Rs.12.74) followed by an instantaneous change from Rs.80.22 to Rs.83.78 (or Rs.3.56). The intermediate value is the price the bond would command at the horizon if its promised yield-to-maturity had remained unchanged at its initial level of 9%. The actual price is that which it commands at its actual yield-to-maturity of 8%. In summary, the total price change can be broken into two parts, representing the two effects:

Price change = time effect + yield change effect

Thus far no account has been taken of the coupon payments to be received before the horizon date. In principle, one should consider all possible uses of such cash flows or at least analyze possible alternative yield structures during the period to determine likely reinvestment opportunities. In practice, this is rarely done. Instead, a single reinvestment rate is assumed, and the future value of all coupon payments at the horizon date is determined by compounding each one using this rate.

For example, if Rs.2 is received every six months, with the first payment occurring six months from now and the last payment occurring five years from now, and if each payment is reinvested at 4.25% per six months, then the value at the end of five years will be approximately Rs.24.29. Of this amount, Rs.20 can be considered interest (coupon payments of Rs.2 for ten six-month periods), with the remaining Rs.4.29 being "interest on interest"..PA

In summary, a bond's overall rupee return has four components - the time effect, the yield change effect, the coupons, and the interest from reinvesting the coupons. In the example, the overall rupee return is

Overall rupee return	=	time effect +	yield change + effect	coupons +	interest on coupons

= (Rs.80.22-Rs.67.48) + (Rs.83.78-Rs.80.22) + Rs.20.00 + Rs.4.29

= Rs.12.74 + Rs.3.56 + Rs.20.00 + Rs.4.29

= Rs.40.59

The overall rupee return can be converted into an overall rate of return by dividing it by the market price of the bond at the beginning of the period, Rs.67.48. Thus it can be seen that a bond's overall rate of return consists of four components:

$$\text{Overall rate of return} = \frac{\text{Rs.}12.74}{\text{Rs.}67.48} + \frac{\text{Rs.}3.56}{\text{Rs.}67.48} + \frac{\text{Rs.}20.00}{\text{Rs.}67.48} + \frac{\text{Rs.}4.29}{\text{Rs.}67.48}$$

$$= .1888 + .0528 + .2964 + .0635$$
$$= .6015$$

or 60.15%. The first term is the return owing to the passage of time, the second term is the return owing to yield change, the third term is coupon return, and the fourth term is the return owing to reinvestment of the coupon payments.

Because the second term is uncertain, it is important to analyze it further. In the example, a change in yield from 9.0% to 8.0% will result in a change in the market price from Rs.80.22 to Rs.83.78. Given that 8.0% was the expected yield at the horizon, an expected overall rate of return of 60.15% was computed. By using different end-of-period yields, different overall rates of return can be calculated. Then, with estimates of the probabilities of these yields occurring, a sense of the bond's risk can be obtained. Indeed, it can now be seen why bond portfolio managers devote a great deal of attention to making predictions of future yields.

2.6 BOND SWAPS

Bond swap is concerned with exchanging a bond for another. Given a set of predictions about future bond yields, holding-period returns over one or more

horizons for one or more bonds can be estimated. The goal of **bond swapping** is to actively manage a portfolio by exchanging bonds to take advantage of any superior ability to predict such yields. In making a swap, the portfolio manager believes that an overpriced bond is being exchanged for an underpriced bond. Some swaps are based on the belief that the market will correct for its mispricing in a short period of time, whereas other types of swaps are based on a belief that corrections either will never take place or will take place, but over a long period of time.

There are several categories for classifying swaps, and the distinctions between the categories are often blurry. Nevertheless, many bond swaps can be placed in one of four general categories:

1. **Substitution swap**: Ideally, this swap is an exchange of a bond for a perfect substitute or "twin" bond. The motivation here is temporary price advantage. presumably resulting from an imbalance in the relative supply and demand conditions in the marketplace .PA

2. **Intermarket spread swap**: This type of swap involves a more general movement out of one market component and into another with the intention of exploiting a currently advantageous yield relationship. The idea here is to benefit from a forecasted changing relationship between the two market components. Although such swaps will almost always have some sensitivity to the direction of the overall market, the idealized focus of this type of swap is the spread relationship itself.

3. **Rate anticipation swap**: Such swaps, on the other hand, are geared toward profiting from an anticipated movement in overall market rates.

4. **Pure yield pickup swap**: These swaps are oriented toward yield improvements over the long term, with little heed being paid to interim price movements in either the respective market components or the market as a whole.

Consider a hypothetical portfolio manager who holds some of a 30-year AA utility bond issue that has a 7% coupon rate. As these bonds are currently selling at par, their yield-to-maturity is 7%. Now imagine that there is another 30-year AA utility bond issue with a 7% coupon rate that is being made available to the manager at a price that provides a yield-to-maturity of 7.10%. An example of a substitution swap is where the manager exchanges a given amount of the currently held bonds for an equivalent amount of the second bond issue, thereby picking up 10 basis points in yield.

Alternatively, the manager might note that there is a 10-year AA utility bond issue outstanding that carries a 6% coupon and is priced at par; thus its yield is 6%. In this case there is a 100-basis-point yield spread between the currently held 30-year bonds and the 10-year bonds. If the manager feels that this spread is too low, then an intermarket spread swap might be used, where some of the 30-year bonds are exchanged for an equivalent dollar amount of the 10-year bonds. Because the manager expects the spread to increase in the future, the yield on the 10-year bonds is expected to fall. This means that the price on these bonds is expected to rise by an abnormal amount, resulting in an abnormally high holding-period return.

Another possibility is that the manager feels that yields in general are going to rise. In such a situation, the manager will recognize that the currently held portfolio is in a very risky position. This is because longer term bonds generally move downward further in price for a given rise in yields than do shorter term bonds, because they generally have a longer duration. Accordingly, the manager might use

a rate anticipation swap to exchange a given amount of the 30-year bonds for an equivalent amount of short-term bonds.

Finally, the manager might not want to make any predictions about future yields or yield spreads. Instead, it might simply be noted that some 30-year AA industrial bonds are currently priced to yield 8%. In this case the manager might want to enter a pure yield pickup swap where some of the 7% utility bonds are exchanged for an equivalent rupee amount of the 8% industrial bonds, the motivation being to earn the extra 100 basis points in yield from the industrials..pa

QUESTIONS

1. Explain the concept and importance of debt portfolio management.
2 Present the concept and process of passive immunization of debt portfolio.
3 What is active debt portfolio management? How is it practised? Is it superior to passive immunisation?
4. What is riding the yield curver? Explain.
5. Explain the concept and mechanism of Horizon Analysis.
6. Present the concept and mechanism and types of bond swaps.
7. A bond of face value Rs.1000 and coupon 10% and having a maturity of 3 years is currently giving at Rs.951.96. Find its duration. (Answer 3.1489).

8. An investor has an outflow of Rs.20,00,000 two years from now. To ward off interest rate risk he considers giving for a bond portfolio involving

   i) 3 year to maturity bond with coupon 10% and face value Rs.1000 with current price of 951.96 and

   ii) a renewable one year bond, face value Rs.1000 and coupon 10% with current price of Rs.982.14. Find the weights of portfolio constituents and actual amount to be invested in each.

   (Answer: Weigfhts : 0.4654 in 3 year bond and 0.5346 in renewable one year bond. Total amount to be invested is Rs.15,94,388. In the 1st bond Rs.742028 and in the second Rs.852360 be invested.)

REFERENCES

1. Investments : William F.Sharpe, Gordon J.Alexander and Jeffrey V.Bailey

2. Management of Investments - Jack Clark Francis.

UNIT - III : EQUITY MARKET

In this lesson are dealt the concept of equity market, nature and features of equity investments, and factors governing equity market growth.

3.1 EQUITY MARKET

Equity market consists of demand and supply sides for common or ordinary or equity shares. In India, equity market is predominant, though beginning 1995 to date (1999 Feb), equity market lost its shine to debt market. The equity market has primary and secondary segments.

3.1.1 Primary Market

The primary market is market for new equity shares floated by corporate undertakings. Equity shares may be issued to general public or to existing shareholders or privately placed. Accordingly, a share issue can be public, right or private, as the case may be. To issue shares in the primary market necessary clearances from the primary market authority, SEBI in India (Security and Exchange Commission in USA) are to be obtained. The market has many intermediaries like manager to the issue, under-writers and brokers to the issue, collecting bankers to the issue, registrar to the issue, and so on. Efficient operation of primary market ensures conversion of household savings into investment in productive ventures. Until 1994, primary capital market in India was riding high. Later it started weakening. It is yet to recover even after 4 years.

TABLE 3.1 PUBLIC & RIGHT ISSUES OF BONDS AND SHARES

Year	1994-95	1995-96	1996-97	1997-98
No. of Issues	1692	1825	882	111
Amount Rs. Crores	27632	20804	14276	4570

(Source: SEBI Annual Report 1997-98)

Table 3.1 gives the trends in the primary market. It could be seen from a peak of Rs. 27632 crs in 1994-95, the market fell to a low of Rs. 4570 crs in 1997-98. The fall of equity market was more market than debt market.

Investor confidence is a must for recovery and growth of primary market in equity. In 1992-94, fly-by-night companies virtually looted the primary market by floating worthless equity issues, taking advantage of the liberalised capital market entry conditions. The investors who lost their hard earned savings in the primary market equity share issues of dubious companies, have virtually stopped investing in primary market issues, leading to the present predicament in the primary market. To revive the primary market a committee to suggest means and measures way appointed under the chair of Dr.Shankar N. Acharya, Chief Economic adviser to GOI. Its recommendations are listed below:

* Listing requirements of stock exchanges to be made more stringent and stock exchanges should be made more accountable to create greater

investor confidence.

* Creation of an effective institutional arrangement for protecting small investors.

* Better corporate governance on the part of industry; accounting norms to be made uniform and international standards to be adopted.

* Part of the public sector divestment being done through the GDR route could be done in the domestic market.

* Market making could be made compulsory at least for a period of six to twelve months after listing of issues.

* Adequate amount of credit to be made available to market makers.

* Derivatives trading should be introduced quickly in order to provide hedge instruments for institutional players.

* Depository mode of transactions to be popularised; the possibility of new issues through the depository should be explored as a means of reducing cost of issue substantially.

* Entry norms for companies to access the market should be made more stringent.

* Greater accountability should be fixed on intermediaries for due

diligence and disclosure norms.

* Private placements have a role; at the same time it should be ensured that public issues are not passed off as private placements. Private placements involving investors above a certain number should be subject to disclosure requirements; alternatively, private placements could be restricted to Qualified Institutional Investors (QIIs) or High Networth Individuals.

Keeping in view the need to develop the primary market as an efficient vehicle for mobilisation of resources, SEBI took a number of measures designed to boost investor confidence. New measures were introduced by SEBI after a series of formal and informal consultations with the market participants, Associations of Merchant Bankers of India and the Advisory committee on primary market. These seek to further simplify the issue procedure to facilitate both resource mobilisation and investor protection.

* Entry barrier for unlisted companies modified as dividend payment in immediately preceding 3 years.

* A listed company required to meet the entry norm only if the post-issue net worth becomes more than five times the pre-issue net worth.

* Companies required to make their party paid-up shares fully paid up or forfeit the same, before making a public/rights issue.

* Unlisted company allowed to freely price its securities providing it has shown net profit in the immediately preceding 3 years subject to its fulfilling the existing disclosure requirements.

* The promoters contribution for public issues made uniform at 20% irrespective of the issue size.

* Written consent from share holders in regard to lock-in made compulsory for securities to be offered for promoters contribution.

* Appointment of Registrar to an issue for rights issues made mandatory.

* A provision made regarding disclosure of the share holding of the promoters whose names figure in the paragraph on promoters and their background in the offer document.

* The SEBI (Registrars to an issue and Share Transfer Agents) Rules and Regulations 1993 have been amended to provide for an arms length relationship between the issuer and the Registrar to the issue. It has now been stipulated that no registrar to an issue can act as such for any issue of securities made by any body corporate, if the Registrar to the issue and the issuer company are associates.

* With a view to facilitating rising of funds by infrastructure projects, SEBI has allowed debt instruments to be listed on the Stock Exchanges without prior listing of equity. Corporate with infrastructure projects and Municipal Corporations to be exempted from the requirements of

Rule (19)2b of Securities (Contract) Regulations Rules to facilitate public offer and listing of its pure debt instruments as well as debt instruments fully or partly convertible into equity without the requirement of prior listing of equity but subject to conditions like investment grade rating.

* Only body corporate to be allowed to function as Merchant Bankers.

* Multiple categories of merchant bankers to be abolished and there shall be only one entity viz., Merchant bankers, presently, the Merchant Banker allowed to perform underwriting activity but required to seek separate registration to function as a Portfolio Manager under the SEBI (Portfolio Manager) Rules and Regulations, 1993.

* Merchant Bankers to be prohibited from carrying on fund based activities other than those related exclusively to the capital market; the activities undertaken by NBFCs such as accepting deposits, leasing, bill discounting, etc. not to be allowed to be undertaken by a merchant banker; the existing NBFCs performing merchant banking activities to be given suitable time to restructure their activities.

To enable banks, including those in the private sector, to access the capital market, relaxations were made in regard to both entry norms and share pricing. Banking companies which had received approval or license from RBI on or before April 16, 1996 and the public sector banks were exempted from entry norms. Since public sector banks are regulated by the RBI, they were allowed to freely price their issues on the basis of profitability for two years as against three years for authors.

The norms for entry and free pricing are not applicable to the private sector and local area banks, which have been granted license by the Reserve Bank. These measures seek to facilitate recapitalisation of commercial banks, which can no longer obtain concessional resource support from the Government/Reserve Bank.

3.1.2 SECONDARY MARKET

The secondary market is the market for liquidity for investors granted through the stock exchanges. Investors should not get stuck with a scrip. It must be capable of being sold and value realised. If this liquidity isn't ensured, primary market would also weaken. Equity securities being, perceptual in nature, secondary market for liquidity is a must. The secondary market must be efficient enough to precisely price a scrip close it its intrinsic value. So ready market, right price and fort proof settlement mechanism are basic requisites of secondary market. Paperless trading, screen based quotation, securities lending, carry forward facility, over the counter facility, etc. are the hall marks of efficient secondary market.

In India secondary market is also regulated by SEBI and operated through 23 stock exchanges. The newly formed National Stock Exchange and the older Bombay Stock Exchange now account for a chunk of deals in the secondary market. The stock market scam of 1992 and the subdued conditions in the secondary market, made the authorities to do some soul-searching to revive sentiments. The stock market indicators are given below:

STOCK MARKET INDICATORS

Market Capitalisation Rs. crore	Index		Price/Earn. Ratio		Average
	Sensex	Natex	Sensex	Natex	Turnover Rs. crore
1997April 528507	3841.11	1646.05	14.81	13.54	644.99
May 533043	3755.10	1612.20	14.24	13.30	571.94
June 619469	4256.09	1827.43	16.17	15.11	865.56
July 626680	4305.76	1863.68	15.84	15.32	931.64
August 579877	3876.08	1694.76	15.80	14.68	1019.03
September 576556	3902.03	1692.32	14.66	12.99	859.58
October 553834	3803.24	1644.16	14.89	13.05	879.28
November 519551	3560.29	1543.10	13.33	11.72	766.32
December 547517	3658.98	1586.60	13.46	12.08	821.54
1998 January 494224	3224.36	1401.38	12.79	11.34	869.03
February 554080	3622.22	1568.83	14.49	12.84	868.25
March 589816	3892.75	1697.14	15.65	14.04	1111.00

1 Monthly Closing. Sensex (Base 1978-79=100) Natex (Base 1983-84=100).

2 Estimated for all India.

Source : SEBI

The year 1996-97 witnessed only temporary buoyancy in share prices which could not free the secondary market from the grip of bear phase. Though the market registered an all time peak in 1997-98 when the BSE sensitive index (monthly closing) climbed to 4306 in July, the index fell thereafter but consistently stayed about 3500 before declining to 3224 in January, 1998. Subsequently the index rose to reach 3893 on March 31, 1998. The East Asian crisis caused jitters in the world capital markets, leading to closure of the New York Stock Exchange (NYSE) twice within a day in late October, 1997. The Indian securities markets however functioned uninterrupted without trading halts and broker defaults. Except for short periods of volatility, the Indian capital market was not affected by the East Asian Crisis. The various measures instituted by SEBI including individual scrip based circuit breakers as opposed to index related circuit breakers prevalent in NYSE and other measures like intra-day trading and exposure limits and marked to market margins were successfully tested out under these conditions of market stress.

3.1.2.2 MEASURES TO IMPROVE SECONDARY MARKET

A number of measures were taken to modernise the stock exchanges in the country. These measures focussed on infrastructure development, transparency, efficiency and enhanced investor protection. Risk management was further strengthened by implementing a comprehensive system of margins, exposure limits and improving the efficiency of clearing and settlement guarantee funds. With a view to enhancing market safety, SEBI fixed intra-day trading and gross exposure limits for brokers These measures which bolstered risk management of the market were tested out several times in conditions of market volatility, especially in the wake of the crisis in the East Asian financial markets. SEBI continued to maintain a constant interface with the stock exchanges on various issues concerning investor

protection, automated market infrastructure and overall improvement in quality of intermediation. SEBI also directed its efforts towards encouraging the stock exchanges to become effective as self-regulatory institutions.

Automated screen based trading which was introduced in the country through the setting up of the OTCEI and NSE and subsequently introduced by the BSE had brought about a qualitative improvement in the market and its transparency. Transaction costs and time were also significantly reduced. During the year several of the smaller exchanges also introduced on-line screen based trading bringing the total number of exchanges having this facility to 20 as against 23 stock exchanges in the country. This implied that 98.8 percent of the total all India turnover on the exchanges had shifted to on-line screen based trading.

In order to enhance liquidity in the capital market, a group set up under the chairmanship of Prof.J.R.Verma reviewed the Revised Carry Forward System (RCFS). The Report of the Group was submitted in July 1997. The modifications to RCFS approved by the regulatory authority include (a) continuance of the practice of segregating carry forward transactions at the time of execution of trade under the twin track system, (b) a lower daily margin of 10 per cent on carry forward trades with the proviso that 50 per cent of the daily margin would be paid upfront, (c) enhancement of overall carry forward limit to Rs.20 crore per broker and (d) removal of limit of Rs.10 crore for badla financier. The recommendations made by the Group in regard to strict enforcement of capital adequacy and related prudential safeguards and monitoring and surveillance system for healthy functioning of the capital market were accepted. Similarly the recommendation stipulating that scrips chosen for carry forward trade should have sufficient floating stock and high liquidity was also accepted. The RCFS has since been adapted and implemented by the stock exchange,

Mumbai.

Warehousing facilitates execution of a large firm-client-order in parts during the same trading cycle, SEBI permitted brokers to warehouse trades for firm orders of institutional clients. To prevent miscue, certain safeguards like reporting requirements, compulsory delivery of warehouse trades, etc. were also introduced. Timely completion of settlement contributes to both efficiency and transparency. Failure of any one member to honour his commitment to the exchange on time has cascading effects. All stock exchanges in the country have therefore been advised to set up clearing corporation/settlement guarantee fund to ensure timely completion of settlement.

The introduction of securities lending scheme by SEBI has filled a long standing gap in the secondary market. It is expected that the scheme will gradually pick up and by facilitating delivery of securities it will help improve the efficiency of the settlement system.

Paperless trading is becoming a fact with a small beginning. All institutional investors (FIs, FIIs, mutual funds and banks) having a portfolio worth more than Rs.10 crore were required to compulsorily trade in and settle eight scrips only through the electronic route with effect from January 15, 1998. The scrips are those of Bank of India, ICICI, IDBI, IPCL, Reliance, SBI, L&T and TISCO. The decision to restrict paperless trading to these eight scrips is to ensure efficient working of the new system before switching to broad based paperless trading or dematerialised trading include reduction in time as well as cost, and elimination of various risks associated with paper-based or physical settlement. The expected efficiency gains of electronic trading may go a long way in higher foreign investment and increased trading

volumes on stock exchanges.

National Securities Depository Limited (NSDL), the first and only depository in India so far, completed one year of operations on November 8, 1997. NSDL was set up to provide an efficient solution to the ills associated with paper in the Indian capital market, to reduce settlement risk and facilitate movement towards rolling settlement. The depository infrastructure grew with more companies, depository participants (DPs) and stock exchange joining NSDL. As on March 31, 1998, 191 companies had entered into agreements with NSDL. The market capitalisation of these companies constituted about 53 percent of the total market capitalisation. Amongst these, demeaterialisation facilities were available for shares of 171 companies and trading facilities were available for shares of 160 companies. On the said date, the number of DPs, through whom NSDL interfaces with investors, stood at 49 which included all custodians providing services to local and foreign investors. These DPs are catering to investors from about 214 locations across the country. The two largest stock exchanges in India viz., the National Stock Exchange (NSE) and the Bombay Stock Exchange (BSE) joined NSDL to facilitate settlement of trades executed in their dematerialised segments. As on January 26, 1998, 828 out of 962 active member brokers of NSE and 329 out of about 600 active members of BSE had opened accounts in NSDL. About 11200 investors, both institutional and retail, had opened accounts with NSDL and had dematerialised about 160 crore shares valued at about Rs.22,000 crore. Transaction/holding costs in the depository environment are cheaper when compared to the same in the physical environment. Enhanced participation in the depository provided the necessary platform to NSDL to make the depository more cost effective. Custody charges were halved from 7 basis point (0.07%) to 3.5 basis points (0.035%) per annum. NSDL also decided to accept a one time payment of 5 basis points (0.05%) from a company on its market

capitalisation and thereafter completely exempt custody charges to its DPs on shares of such companies. As on March 31, 1998, twenty seven companies had availed of this facility. Some banks charged a lower rate of interest on loans and advances given against shares pledged in the dematerialised form.

Affirmative regulatory intervention at a critical juncture imparted additional momentum to the depository process. The Securities and Exchange Board of the India (SEBI) amended the relevant statutory provisions to make it mandatory for FIIs and Mfs to settle only in the dematerialised segment with respect to a select basket of eight securities w.e.f. January 15, 1998. Directives to the above effect were also issued by the Government of India and the Reserve Bank of India (RBI) to financial institutions and banks respectively. Further, the RBI also advised the banks to consider joining the depository as DPs.

3.1.2.3 NATIONAL STOCK EXCHANGE (NSE)

The capital market segment of NSE started operation in November 1994. Initially the entire turnover originated from Mumbai. Subsequently expansion programme facilitated growth of NSEs trading terminals at a steady pace. As on March 31, 1998 NSE terminals operate in 179 cities spread across 18 states. In order to bring all trading members operating from different cities on par with Mumbai based counterparts NSE has introduced full range of inter-region clearing facilities. NSE witnessed a quantum jump in its trading turnover from Rs.68,141 crores in 1995-96 to Rs.2,94,504 crores in 1996-97 which further jumped to Rs.3,69,932 crore in 1997-98. The NSE launched Nifty and Midcap indices, which constitute 50 securities each on April 22, 1996 and January 1, 1997 respectively. The Nifty securities are highly liquid securities, which account for approximately 44 percent

of the total market capitalisation of the Exchange.

The total turnover in respect of NSE stood at Rs.22,276 crore in April 1997. This rose to Rs.40,980 crore in July, 1997 but declined subsequently and stood at Rs.30,625 crore in March, 1998. The ratio of total delivery to total turnover in April, 1997 was 17.7 percent, which rose maringally to 17.9 percent in August 1997 before declining to 13.7 percent in December 1997. The ratio recovered to 17.8 percent in March 1998.

3.1.2.4 BOMBAY STOCK EXCHANGE (BSE)

The Bombay Stock Exchange is on-line. The Bombay Online Trading System (BOLT) enabled the oldest stock exchange in India to expand trading activities to 118 cities across the country. BOLT has at present capacity to handle 5,00,000 trades in a seven hour trading session per day. During 1997-98, trading volume in on BSE ranged between Rs.11,413 crore and Rs.23,310 crore as against Rs.6,248 crore to Rs.14,863 crore in 1996-97. The ratio of total delivery to total turnover in April 1997 was 8.1 percent, which rose to 9.1 percent in July 1997. The delivery ratio declined in the following two months but registered a steep increase thereafter to reach 16.1 percent at the end of March 1998.

3.1.2.5 TURNOVER AND DELIVERY PATTERN

Though secondary market in India has witnessed a relatively high percentage of speculative transactions, the ratios of delivery to turnover at the Bombay and National Stock Exchanges are higher than those in other stock exchanges in the country. For 1996-97 the combined figures of BSE and NSE in respect of turnover

and delivery were Rs.4,17,508 crore and Rs.48,624 crore respectively. The corresponding figures for 1997-98 were higher at Rs.u,73,969'crore and Rs.85,491 crore respectively.

3.1.2.6 MARKET CAPITALISATION

As per the BSE calculations, the All India Market capitalisation witnessed mixed trend. It rose from Rs.4,73,349 crore as on March 31, 1995 to Rs.5,72,257 crore as on March 31, 1996. However, it declined to Rs.4,88,332 crore by March 31, 1997 before it rose to Rs.5,89,816 crore as on March 31, 1998.

3.1.2.7 FOREIGN INSTITUTIONAL INVESTORS (FIIs)

Purchases by FIIs constitute a significant proportion of deliveries on BSE and NSE. The net investment of FIIs till end March 1998 amounted to US $9284 million. However, there was a fall of 32 percent in net FIIs investment during 1997-98 over 1996-97. For the first time since FIIs began investing in the Indian securities market in January, 1993 monthly net investment by them became negative in November 1997. However, the net outflow of FII investment, which started in November 1997 was reversed in February, 1998.

Global depository receipts are also equity investments (For details refers to Paper 2.4 Global Investments and Instruments).

3.2 EQUITY INVESTMENT : NATURE & FEATURES

GDRs & ADRs. In this section nature and features of equity investment are

analysed.

3.2.1 NATURE AND FEATURES OF EQUITY INVESTMENT

Equity represent ownership position in a corporation. Equity investments are entitled for residual claims only after meeting payments to creditors. Equity investments provide voting rights. Equity investments can be traded through stock exchange if liquidity is needed. Now, re-purchase by issuing corporations is to be allowed. Minority equity investors might have to be saved from oppression by majority equity investors in a corporation, through corporate laws which provide for protection of minority rights. Corporate take overs, mergers and acquisitions are effected by acquiring equity shares in the open market or from promotor group or both.

Limited liability for the holder is a feature of equity investment. Dividend is payable, if only there is divisible profit and the Board of directors recommend paying dividend, and the AGM approves the recommendations. The book value of assets over liabilities is called capital. If this exceeds face value of equity shares, it is good for investors in equity shares. But all these can be manipulated, by management. So market value of equity share is important through it can also be manipulated with connivance of stock brokers and others. Equity shares of well run corporations are a bonanza for investors as their market value rises and capital gain is available. They pay good dividend as well. These securities are also accepted as collateral for raising loans. In India, the equity shares of Hindustan Lever Limited are real treasure for investors. Equity shares of ill-run corporations worth not even the paper on which the share certificates are printed. Equity investments suffer higher risk due to bull/bear operations in the market. The bullish operators may concretely excavate

the value of poor scrips and bear operators may hammer out even good scrips. Uninformed investor may lose by buying the former and selling the latter. When companies go risk, return of capital, as against return on capital invested is at stake. In India many equity shares floated during the bull season 1993-94 and 1994-95, are quoting below issue price or below par. For certain scrips there no quotation is available. So investors are saddled with worthless papers in the name of share certificates. Of late, bearing few scrips, long term investment in equity is inviting risk without commensurate return. Just like value depreciation, value appreciation is a feature of equity market. Bonus shares, warrants, etc. add shining to equity scrips in the case of few scrips. During 1998-99, MNC scrips, information technology companies' scrips shined well.

3.3 FACTORS GOVERNING EQUITY MARKET

Several factors govern the growth/decline of the equity market.

Economy factors, industry factors and company factors are one set of factors affecting equity market trend as per the fundamentalists.

Buying and selling pressures, speculation, bullish/ bearish cycles and price patterns are the other set of factors according to the technical analysis.
We shall consider all these below:

[Learners are advised to refer paper 1.1 investment analysis, they had studied in the I year of the NIM Programme for more details].

3.3.1 FUNDAMENTALISTS FACTORS

In this section the fundamental factors affecting equity market are presented.

3.3.1.1 ECONOMY FACTORS

These are macro factors at the national or even global level affecting equity market. The GDP GNP growth rate, the GNI and GNS growth rate, the incremental capital output ratio, the efficiency of factors of production, R & D activities, the export and import trend, the forex reserves, the foreign exchange rate stability, the patent rights the nation had got, the competitive standing of the nation, the employment level and employee efficiency, the infrastructural facilities and their efficiency, the political stability and dynamics, international relations, level of globalisation of the economy the fiscal deficit, tax rates, momentary policy, customs tariff levels, inflation level, interest rate and cost of capital, uncertainties in the economy, trade cycle, government policy on FDI, FPI, Non-resident citizens investment etc, have a major influence on equity market. Investment culture of people, equity cult among people, risk-preference level of people, entrepreneurial spirit of people, etc. influence equity market very well. In recent times it is found that political and international relations influenced market sentiments in India.

3.3.1.2 INDUSTRY FACTORS

Growth phase of the industries, cyclical nature of the different industries, state of competition in the industries, cost efficiency of industries, technological efficiencies of industries, strategic alliances that industries have established, export competitiveness of industries, innovativeness of industries, overseas expansion of

industries, growth rates of industries, labour relations in the industries, joint venture with global leaders, nature of industries (i.e primary, secondary or tertiary) and composition etc. influence equity market. If particular industry gets concessions from government and has expanding market, equity of firms of that industry appreciates.

3.3.1.3 COMPANY FACTORS

Quantitative factors such as sales trend, operating cost trend, earnings trend, liquidity trend, solving trend, turnover trend, leverage through debt-equity mix, tax-holidays, investment subsidies, business, financial and market risk involved, risk-free rate of return, employee productivity, power supply position, share of export sales in total sales, etc. are certain factors affecting individual companys stock prices. Qualitative factors such as management vision, labour relations, organisational estimate, political fixing and backing up, distribution efficiency market leadership, equity of personnel, availability of infrastructure, innovativeness of the company, R&D skills of the firm, etc. influence equity value of the concern. The future plans and prospects are very important factors

3.3.2 TECHNICAL FACTORS

Let us discuss the technical factors below:

3.3.2.1 DEMAND AND SUPPLY FACTORS

What is the trend and level of demand and supply for the equity securities? If demand pressure exceeds supply pressure, market grows and vice versa. Beginning

the later months of 1998, demand for info-tech scrips and scrips of selected MNCs producing fast moving consumer goods started rising and that led to the growth in the BSE sensex and market capitalisation.

3.3.2.2 SPECULATION

Speculation influences any market; more so the equity market. In the pre-scam period of 1992, Indian scrips went through the roof. Immediately after the scam, scrips fell down.

3.3.2.3 BULLISH/BEARISH SENTIMENTS

During the 1994 Bullish period, Indian bourses swelled. The sensex hit all-time high of 4634 points during Sep 1994. High rate of economic growth, stable political and policy environment increasing apetite of people for equity led to the bullish phase. Then followed a bearish spell and it still continues. Now in Feb 1999, the sensex has somewhat recovered to 3300 points or so. The involvement of FIIs helped buoying up the sentiments to this extend.

3.3.2.4 PRICE CHART PATTERN

Technical analysts would say that stock indices and stock price follow certain patterns and patterns repeat. Head & shoulders, V base, inverted V, Saucer, inverted saucer, flag, triangle, channel, etc. are certain charts depicting price patterns. As patterns alternate peaks and throughs in equity market alternate. Anything that goes up in the equity market will come down and anything that goes down will go up is the general rule. But these are exceptions to the role. Generally, price hovers around

intrinsic value. If intrinsic value rises and is expected to rise for fureseeable future. price also rises. HLL scrip perhaps best describes the above situation.

QUESTIONS

1. Explain the composition and nature of equity market.
2. Present the trends in primary equity market in India.
3. Present the trends in secondary equity market in India.
4. Sketch the recent developments in the governance of corporate market.
5. Give an account of factors influencing equity market.
6. What are Global depository receipts? Explain their nature and features.
7. Account for the rising trends of equity market during 1994-95 and falling trends during 1998-99.

REFERENCES

1. Govt. of India, Economic Survey, 1997-98.
2. RBI, RBI Bulletin, Nov. 1998.

UNIT IV - EQUITY VALUATION

In this lesson concept of value determinants of value, dividend models and P.E. model for equity valuation are presented.

4.1 CONCEPT OF VALUE

There are different concepts of value. Book value, market value or price, intrinsic value (or discounted present value or economic value), nominal value, real value, etc are certain concepts of value.

Book Value refers to the historical cost based value. Let us take the cost value less depreciation of fixed assets of a company as Rs. 5 crs. And say the value of its current assets is Rs. 4 crs, making total book value of assets Rs. 9 crs. Let the long term and current external liabilities be Rs. 4.8 crs. So, net worth of the company is Rs. 4.2 crs (ie., 9-4.8). Assuming the number of outstanding shares (all equity) at 4,00,000, the book value per share comes to Rs. 105. Book value of shares of old companies might be lower than similarly placed, but new companies, because the latter's book prices are inflation-hit.

Market Value of a share is its price in the bourse. Or it can be taken differently. Compute the market value of all assets. Subtract market value of liabilities from the aggregate total market value of assets. The remaining market net worth when divided among number of outstanding shares, you get market value or more appropriately market (imputed) value of a share, because it is not the traded value. So market value may refer to the traded and imputed market values.

Intrinsic Value or Economic Value or Discounted Present Value, is very important measure of value. How does any thing gets value? From returns expected to be derived, any thing gets value. The returns may be monetary or otherwise. As to investments monetary returns are the seeds and soul of value of the same. Since returns are expected to be derived over a period, when they are expected and the certainty with which these are expected to be received, besides the actual size of returns are important. The returns over entire period over which the same is expected must be covered. If certainty is more a less discount rate (because of lower risk) and if the same is low, a higher discount rate are to be used. Net value varies inversely with the discount rate employed.

Suppose from an investment you are expecting a payment of Rs. 5, 5, 5, 5 and Rs. 30 over 1st through 5th year, all receipts at year end. If we use a 20% discount rate, the present value of these future receipts is: $5/(1+20\%) + 5/(1+20\%)^2 + 5/(1+20)^3 + 5/(1+20\%)^4 + 30/(1+20\%)^5 = 90/(1.2) + 5/(1.2)^2 + 5/(1.2)^3 + 5/(1.2)^4 + 40/(1.2)^5 = 4.167 + 3.472 + 2.894 + 2.411 + 12.056 = 25$. This is also known as intrinsic value or economic value. If 10% discount rate is used instead, the PV will be higher at: $5/(1.1) + 5/(1.1)^2 + 5/(1.1)^3 + 5/(1.1)^4 + 30/(1.1)^5 = 4.55 + 4.13 + 3.75 + 3.42 + 18.63$ = Rs. 34.48.

We can generalise the valuation model as below. PV or IV or EV = Summation: $E_t/(1+r)^t$, Where E_t is earnings flow over time, 't', r is the discounting rate and 't' is time which is measured normally in years varying from 1 to n. If different 'r' is to be used year after year, then the formula will be: $E_t/(1+r_t)^t$.

If a given earnings is to be perpetually received, at annual rests, the PV of that future scheme of income is given by: E/r, Where "E" the earnings and 'r' the

discounting rate. Suppose as per terms of an insurance policy, the survivor of a joint policy is given annually Rs. 10000 until he breaths his last. Assuming the survivor survives for a fairly long period and an interest rate of 12% (ie., the "r"), the PV of the annuity is: Rs. 83333 (or Rs. 10000/0.12). At r = 10%, the PV will be Rs. 1,00,000.

If the future earnings is supposed to grow annually at, say, 5% or so, the present value of future earnings stream is given by: $E_1/r-g$, Where E_1 is expected earnings one year hence or next earnings amount, r - the discount rate and 'g' is annual growth rate in earnings. Suppose the insurance company agrees to pay 5% more every year over previous year. And if E_1 = 10000, the PV = 10000/(12% - 5%) = 10000/0.07 = Rs. 1,42,857.

Nominal Value is the money value at current money units or current costs. Suppose you deposited Rs. 10000 on 1.1.95 for three years carrying 15% interest, interest compounded annually. .pa

So the maturity value on 1.1.98 is: $10000(1+r)^3 = 10000(1+15\%)^3 = 10000(1.15)^3 =$ 15208.75. So, Rs. 15208.75 is the nominal value of your investment.

Real Value is the inflation/deflation adjusted nominal value. Assume in the three years, inflation averaged 6% p.a. Then the real value of the Rs. 15208.75 nominal sum is: $15208.75/(1.06)^3$ = Rs. 12770.

The investors real value is more important. If only investments return more than the rate of inflation, there will be real value addition.

The concept of valuation assumes importance both from the view point of the

investors as well as company. All investment decisions are based on a scientific analysis and prediction of the right price (value) of share. Hence, an understanding of the valuation of securities is essential for investors.

The valuation of securities based on the concepts of the 'time value of money' and 'risk-return relationship'. The fundamental basis of value of a security is the amount of returns and the level of risk. This is to say, principally the value of a company depends upon the value of expected return that can be measured in terms of net cash inflows generated by the company assets. The actual value of security is to be ascertained by considering the time value of money by discounting the cash inflows at the cost of fund.

Thus the value of any security, from the financial point of view, is equal to the sum of the present values of the benefits associated with it. Symbolically,

$$Vo = \frac{E1}{(1+K)^1} + \frac{E2}{(1+K)^2} + \dots \frac{En}{(1+K)^n} = \sum_{t=1}^{n} \frac{Et}{(1+K)^t}$$

Value Vo - value of asset at time zero; C_t - Expected earnings flows at the end of each period, t; k - discount rate appropriate to the cash flows; n - expected life of the asset and Sumn. summation.

4.1.1 TIME VALUE OF MONEY

Time value of money concept is central to understanding securities price. An individual's preference for possession of a given amount of cash now rather than the same amount at some future time is called time value of money. There are

reasons for the individual's preference for current money over future money. These are:

i. Uncertainty
ii. Subjective preference for present consumption and
iii. Better investment opportunities to get more cash.

In other words the time value of money concept state that a rupee received today is worth more than a rupee received tomorrow. Investor will postpone present consumption and invest only, if their future consumption opportunities will be larger as a result of the investment. Alternatively, a rupee today must be worth more than a rupee tomorrow given the fact that one can convert the rupees today into investment and start earning interest immediately. Thus it takes more future rupees to equal the value of a current rupee.

This simple concept of time value of money shall be quantified in order to value the securities properly. There are two mathematical procedures of compounding and discounting for this purpose.

Compounding is a process by which the terminal value of an investment is ascertained at a given rates of interest by computing compound interest on it. The formula for compounding is:

$$En = Eo\,(1+r)^n$$

Where

En - the compound value; Eo - the original investment amount; r - rate of interest; n - number of years of investment

Discounting is reverse process which ascertains the present value of future estimated cash flows on a given discount rate. The formula for discounting is:

$$Eo = Sum\ n \frac{En}{(1+k)^n}$$

Where

Sumn - Summation

Eo - present value of future cash flows;

En - future cash flows;

k - the discount rate or expected rate of return;

n - the number of years

4.1.2 RISK RETURN - VALUE RELATIONSHIP

Value of a scrip depends on return on the scrip and risk associated with that return. Table 4.1 explains risk return value relationship.

Table 4.1

Level of risk	Level of Discount rate	Level of Return	Level of value
Low	Low	Low	Moderate
Low	Low	High	High
High	High	Low	Low
High	High	High	Moderate

4.1.3 APPROACHES TO VALUATION

In the process of valuation of securities, the investor must be highly systematic and multi-dimentional. As per the "Valuation concept", explains in the previous section, the value of a security is based on the return as well as the probability (risk) of getting the return. the task of investment analyst becomes more complex because it related to the future which is highly uncertain. Various estimates are to be made relating to

a) future earnings and

b) the probability of getting such returns

They are four approaches of security analysis, namely.

1. Fundamental approach
2. Technical approach
3. Academic approach
4. Eclectic approach

Further, depending on the nature of securities, either bonds, or preference shares, or equity shares or convertible securities, there are specific models of valuation. Modern portfolio analysts further evolved various Asset Pricing theories like Capital Asset Pricing Model (CAPM), Arbitrage Pricing Theory (APT). The present section of this lesson is confined to a) brief description of approaches to security, valuation, and b) principal valuation models for different kinds of securities.

i. FUNDAMENTAL APPROACH

The fundamental analyst focuses on the intrinsic value of a stock. The intrinsic value (equilibrium price) depends on the earnings potential of the security, inturn on fundamental factors such as quality of management, outlook for the industry and the economy and the like.

The basic tents of the fundamental approach are as follows 1. The intrinsic value of a security depends upon underlying fundamental factors like company, industry and economy. 2. An any given point of time, there are some securities for which the prevailing market price would differ from the intrinsic value. Sooner or later the market price would fall in line with the intrinsic value. 3. Superior returns can be earned by buying under priced securities and selling over priced securities.

ii.TECHNICAL APPROACH

The technical analyst endeavors to predict future price levels of stocks by examining one or many series of past data from the market itself. The basic assumption of all the technical theories is that history tends to repeat itself. That is, past patterns of price behavior in individual securities will tend to recur in the future. The basic premise of technical analysis is that there are certain recurring patterns of price movements which can be discerned by analysis of market data. The assumption is that past price movements both of particular shares and of market prices generally reveal recuring patterns on the basis of which future trends may be predicted. Academic approach/efficient market theory.

iii. ACADEMIC APPROACH/EFFICIENT MARKET THEORY

The efficient market theory consider the level of efficiency of the capital market. It believes that market is efficient when the information about individual stocks is available in markets. In such case each investor has equal information about the stock market and prices of each security. Therefore, no investor can continuously make profits on stock prices.

The academic community studies various aspects of the capital market, with the help of fairly sophisticated methods of investigations. They are of the view that stock market are reasonably efficient in reaching quickly and rationally to the flow of information. Stock price behaviour corresponds to a random walk. This means that successive price changes are independent. In the capital market, there is a positive relationship between risk and return.

The EMH has three forms: weak, semi-strong and strong. This means the market is weakly efficient, fairly efficient or strongly efficient as transmitters of information.

iv. ECLECTIC APPROACH

The eclectic approach draws on all the three different approaches discussed above. The basic premises of eclectic approach are:

1. Fundamental analysis is helpful in establishing basic standards and benchmarks.

2. Technical analysis is useful in broadly gauging the of supply and demand forces.

3. The academic approach suggests when the market seems to react reasonably efficiently and rationally to the flow of information.

THE OPERATIONAL IMPLICATIONS OF THE ELECTRIC APPROACH ARE:

a) Conduct fundamental analysis to establish certain value 'anchor':

b) Do technical analysis to assess the state of the market psychology:

c) Compare fundamental and technical analyses to determine which securities are worth buying, holding and disposing of:

d) Respect market prices and do not show excessive zeal in 'beating the market':

e) Accept the fact that the search for a higher level of return often necessitates the assumption of a higher level of risk

4.2 DIVIDEND MODELS FOR VALUATION OF EQUITY

As to equity share valuation we have different models. Constant dividend model, constant growth dividend model, multiple growth model, earnings capitalisation model, book value model, market value model, etc are certain models

dealt here.

Constant Dividend Model or Zero Growth model assumes a constant and perpetual dividend per share (DPS). Given the desired rate of return, ie., the 'r' we can use the 'E/r' model. A share is promising an annual Rs. 4 dividend for an endless period. If expected return = r = 20%, find the value of the share: PV = E/r = 4/20% = Rs. 20. This model lacks pragmatism as constant DPS is not usually the case.

Constant Growth Dividend Model, assumes a DPS that grows by certain percent 'g' annually. The PV = D_1/(r-g), where D_1 is next dividend, r } expected rate of return and g = growth rate.

Last year a company paid Rs. 4 as DPS. DPS is growing at 10% p.a. Expected return is 20%. Then, PV = Last Dividend (1+g)/r-g = 4(1+10%)/20% - 10% = 4.4/ 10% = Rs. 44. This is an improvement over the previous model, though constantly growing dividend is not easy to obtain in real world. Dividend models may not reflect true worth of a scrip. Growth firms prefer to pay less and retain more so that cheap-funded growth and diversification are possible. But this low payout might put share values at reduced levels. But rising rate of growth could ensure increase in share value. Declining firms may pay very high dividends, because they have no investment plans. So, the dividend model will put high value on those shares, though in reality these are not so. However as growth rates would eventually decline, such premium valuation might not occur.

Multiple Growth model of equity valuation assumes, that dividend grows at different rates of growth. Simplicity sake, it may be taken that for the first 5 years

dividend is growing at "g_1" rate, for the next 10 years it is growing at "g_2" rate and latter at "g_3" rate for ever. So 3 levels of growth are assumed. It could be two or more.

Let us take an illustration on the equity shares of Wonders Ltd. A dividend income of Rs.10 was last received. For next 3 years the growth in dividend is 10% p.a, for next 6 years it is expected to be 12% p.a. Later it is to grow at 15% p.a indefinitely. Its value can be determined as follows, given K=20%.

Step 1

First get the values of dividend for years 1, 2, 3, 4, 5, 6, 7 and 8. That is, for eight years [(3+4)+1], dividend has to be computed. That is D_1, D_2, D_3, D_4, D_5, D_6, D_7 and D_8 are needed. The same is worked as below taking last dividend Do as Rs.10/-.

Year	Dividend notation	Growth rate	Dividend value = (previous dividend)(1+g)
1	D_1	g_1 = 10%	10 (1+10) = 11.00
2	D_2	g_2 = 10%	11 (1+10) = 12.10
3	D_3	g_3 = 10%	12.10(1+10) = 13.31
4	D_4	g_4 = 10%	13.31(1+10) = 14.91
5	D_5	g_5 = 10%	14.91(1+10) = 16.70
6	D_6	g_6 = 10%	16.70(1+10) = 18.70
7	D_7	g_7 = 10%	18.70(1+10) = 20.94
8	D_8	g_8 = 10%	20.94(1+10) = 24.08

Step 2

Since, from 8th year, dividend grows at a constant rate of 15% p.a. on the basis of D_8, k and g_3 we can get value of the share at the end of 7th year or V_7 as follows:

$$V_7 = D_8 / (K - g_3)$$
$$= 24.08 / (20 - 15)$$
$$= 481.6$$

Step 3

Find the present value of D_1, D_2, D_3, D_4, D_5, D_6, D_7 and V_7, taking 'K' as discounting rate. This is done as below

Detail	Amount	PVIF at 20%	Present value
D_1	11.00	0.833	9.163
D_2	12.10	0.694	8.397
D_3	13.31	0.579	7.706
D_4	14.91	0.482	7.187
D_5	16.70	0.402	6.713
D_6	18.70	0.335	6.265
D_7	20.94	0.279	5.842
V_7	481.61	0.279	134.366
Vo	-	-	185.640

$$Vo = \text{Sum } n \frac{D_t}{(1+k)^t} + \frac{V_7}{(1+k)^7} = \text{Rs.}185.64$$

Appropriate Discount Rate or Required Rate of Return or Capitalisation Rate or "r"

In our analysis we have been using one "r", referred to as required rate of return. What should be the quantum of the same? This depends on the risk involved in that scrip or share. The following table 4.2 gives appropriate level 'r' for diff. levels of risk.

TABLE 4.2

RISK LEVEL AND DISCOUNTING RATE

(ADAPTED FROM MANAGEMENT OF INVESTMENTS BY: J.C.FRANSIS)

Level of Risk	Level of Discounting Rate
Very Low	8%
Low	10%
Low Medium	12%
Medium	14%
High Medium	16%
High	18%
Very High	20%
Speculative	25%
Very Speculative	33%
Gamble	50%

4.3 P-E MULTIPLE METHOD

Price divided by Earnings is an important measure of worth of a security. Say a share is quoting at Rs. 195 in the market and the EPS is Rs. 39. Then P-E ratio comes to Rs. 195/ Rs. 39 = 5. The inverse of PE ratio is the market capitalisation rate of the scrip. In this case it is 20%.

From P-E ratio, intrinsic value is obtained by multiplying EPS by P-E ratio.

Intrinsic Value = EPS x P-E ratio. And,

Expected P-E ratio = Intrinsic Value/EPS

= (Dividend)/(r-g)/EPS (on the basis "D+g" model)

= (Dividend/EPS)/r-g

= Payout Ratio/r-g

USE OF P-E RATIO

We can calculate actual and expected P-E ratios, which can be used for investment decisions.

$$\text{Actual P-E Ratio} = \frac{\text{Current Price of a Share}}{\text{Current EPS}}$$

$$\text{Expected P-E Ratio} = \frac{\text{Intrinsic Value}}{\text{EPS}}$$

If Actual P-E ratio is > Expected P-E ratio, the stock is over priced and it must be sold before its price falls.

If Actual P-E ratio is = Expected P-E ratio, no trade is suggested.

If actual P-E ratio is < Expected P-E ratio, the security is underpriced and hence a hold and buy and hold strategy is good.

HOW EXPECTED P-E CAN BE IMPROVED?

$$\text{We know, Expected P-E multiple} = \frac{\text{Payout ratio}}{r-g}$$

By enhancing the numerator, by enhancing "g" and reducing "r", Expected P-E ratio can be maximised. Payout ratio and "g" can be manipulated, but "r" is a market determinant. Declining firms, by manipulating payout ratio and "g" present an inflated expected P-E ratio for a short-while. This cannot be sustained. But growth firms. can sustain a higher expected P-E ratio, because in their case "r" is sub-dued as market respects the firm and accords a low risk premium. Thus even if pay-out ratio is lower and "g" also is lower, through a lower "r", these firms can usher into a higher expected P-E ratio.

Illustration

Compute actual and expected P-E ratios given, Current price Rs. 60; DPS = Rs. 4; EPS = Rs. 6; r = 18%; g = 8%. Advise on investment decision.

$$\text{So, actual P-E ratio} = \frac{\text{Current Price}}{\text{EPS}}$$

$$= 60/6 = 10$$

$$\text{Expected P-E ratio} = \frac{\text{Payout Ratio}}{r - g} \text{ or } \frac{\text{DPS/EPS}}{r - g}$$

$$= \frac{\text{Rs. 4/Rs. 6}}{0.18 - 0.08}$$

$$= 6.67$$

$$\text{Alternatively, expected P-E ratio} = \frac{\text{Intrinsic Value}}{\text{EPS}}$$

$$\text{Intrinsic Value} = \frac{D}{r - g} = \frac{\text{Rs. 4}}{0.18 - 0.08} = \text{Rs. 40}$$

$$\text{So, expected P-E ratio} = \frac{\text{Rs. 40}}{\text{Rs. 6}} = 6.67$$

This scrip is overpriced as its actual P-E > expected P-E ratio. It must be sold out immediately, if it is held.

P-E ANALYSIS A MARRIAGE BETWEEN TECHNICAL AND FUNDAMENTAL ANALYSES

Later in Units VI and VII you will learn fundamental and technical analyses. For the moment, it is suffice to say, technical analysis and technical analysts use price data very much in their investment decisions, while fundamental analysis and fundamental analysts use earnings data very much. In P-E analysis, thus two schools are wed-locked and converged, because both price earnings are used.

Generally, a high P-E indicates enormous demand for the scrip, even though EPS is small. This can happen only if the scrip is a darling of the market, the management is good and potentials are fine. Else, there must be enormous liquidity and speculative interests in the scrip. Any case P-E ratio exceeding 15 indicates enormous heat or enormous expectation. If it is the former, better don't hold on to the scrip.

A low P-E is a sign to hold and buy-and-hold, provided liquidity is fine and potentials are good. Most illiquid scrips have low P-E. And they are not good candidates to invest. A P-E ratio of less than 5 indicates a buy signal, provided other things are good.

So, you have to go beyond P-E ratios. You have to go into potentials, liquidity and related aspects.

4.4 EARNINGS BASED VALUATION MODEL

Earnings Capitalisation Model involves the EPS being capitalised. Say the

EPS = Rs. 8. And capitalisation rate is 20%. The PV of the share = Rs. 8/20% = Rs. 40.

EPS is unaffected by dividend pay-out ratio.

There are companies, good ones to, which do not pay dividend. As per the dividend models, if dividend is not declared, value becomes zero. A company might not pay dividend as it might plough back entire earnings. It's share commands respects in the market. In such cases, value of the scrip can be found by capitalising earnings per share.

QUESTIONS

1 Explain the concepts of value and valuation models of equity shares.

2. How are equity securities valued?

3. What factors influence the intrinsic value and price of a scrip?

4. What is P-E ratio or Earnings multiple? Explain the significance of P-E ratio in investment decision.

5. You have to go beyond P-E ratio. Comment.

6. An equity scrip has returned a dividend of Rs. 3, 3.3 and 3.63 over past three years. If the "r" is 20%, expected EPS = Rs. 6 and current price is Rs. 40, suggest whether it is a good buy using actual and expected P-E ratios.

7. Present Value-Price interaction model.

8. A scrip returned Rs.7 as dividend last year. The 'g_1' lasting for 3 years from now is 14%, the 'g_2' lasting for 4 years from now is 16% and 'g_3' lasting thereafter is 18%. If K =20% find the intrinsic value of the scrip.

REFERENCES

1. Alagappa University, DDE - MIM Course Material on Investment Analysis - Dr.M.Selvam

2. Investments - William Sharpe

UNIT V - GOVT. SECURITIES

In this lesson instruments of government securities, operations in them and significance of government securities are dealt with.

5.1 GOVT. SECURITIES

Government Securities are issued by Govt. and Semi-govt. institutions through the RBI to the public represented by banks, financial institutions (FIs), Investment Institutions, PFs (Pension Funds), Companies, etc. Since 1992, these securities are auctioned and the discount on sale determining the rate of interest. Banks have to invest 31.5% of aggregate net deposits and 25% of incremental deposits (since 1992), PFs and insurance firms have to invest 30 to 50% of their total funds, Non-banking finance companies have to invest a minimum of 15% of total funds and LIC has to invest 75% of its funds in Govt. and Semi-Govt. securities. Now relaxations are made, but still as govt. securities yield a risk-free return exceeding 11% or so, investment firms prefer to invest in the govt. securities. The market for govt. securities is also called gilt edged securities.

5.1.1 FORMS OF GOVT. SECURITIES

14, 91 and 364 day treasury bills (TBs), State Govt. securities and Govt. of India dated securities are the different securities of the gilt market. Earlier 182 day TB were in vogue till 1992. The TBs are short term market borrowing instruments and are called ad-hocs. These are being phased out of late.

The Govt. securities market is mainly over telex and OTC. The primary issues

through the RBI is notified in the press. Secondary market trading is firstly between RBI and banks and primary dealers. Discount and Finance House of India (DFHI) and authorised brokers. Dealings through SGL operations and delivery against payment and transparency in dealings are insisted.

The Govt. securities are issued at present in the form of stock certificates and Promissory Notes. If they are stock certificates, they are registered with the RBI. Banks and Financial Institutions are permitted to hold these in the Subsidised General Ledger (SGL) account with the RBI instead of taking them in Physical stock Certificates. For transfer after buying and selling, if they are held in the books of SGL of the Public Debt Office (PDO) of the RBI, their book entries would be enough to effect the transfer. Otherwise, these stock certificates are not transferable by mere endorsement as in the case of SGL books of the RBI and can be transferred by executing transfer deeds, as per the requirements of Law.

The RBI is a banker to govt. and as such debt management is a responsibility of the RBI and banks and RBI hold the bulk of the Public debt of the govt. in the form of these securities. Only a small proportion of it is held by Insurance Companies, PFs etc. The holder of these Securities do not operate in this market for portfolio Management purposes except for in the case of foreign banks and SBI. Otherwise the secondary market in these securities is not active.

Certain innovative instruments were coined recently. These are:

i) Conversion of 91 day and 364 day Treasury bills into dated securities and at the option of holders.

ii) Controlled sale of bills on tap basis at prices determined in auctions.

iii) Zero coupon bonds were issued by the centre in January 1994. Which became attractive due to their special features of no reinvestment risks and with tax advantages. There is no TDs collected on income from TBs and Govt. securities.

iv) Auctioned securities made on instalment payments - partly paid stock.

v) Phased elimination of automative monetisation of central govt. debt-role of adhocs was reduced and they are phased out and by an agreement with the govt. first for limiting the resort of adhocs to a specified amount and later replace the facility by ways and means advances as in the case of state govts. The agreements was originally made with the Govt. in September 1994, and phasing out took place by 1997-98.

5.2 OPERATIONS OF GOVT. SECURITIES

In the govt. securities market, as in the case of Corporate Securities there are two sections, namely, Primary Market and Secondary Market. The chart below shows the details of these markets.

CHART 5.1 GILT EDGED MARKET

Primary Market <————	RBI ————>	Secondary Market
:	:	:
:	:	:
Wholesale Market (System of PDs).	Underwriting Support	Retail Market (System of PDs)
:	:	:
:	:	:
Banks, FIs, LIC, GIC, PF, etc	Issue of Certificates & Servicing	DFHI, STCI, Brokers Banks, FIs, PFs, etc

The Primary Market is a wholesale market where RBI is the underwriter and allots the securities to the applicants on behalf of the government. Many of these are sold now on auction basis and allotments are made to those whose bids are above a reasonable level set by the RBI. On the same basis, the RBI sells the Repos (or Repurchase Agreements) of government securities to the institutions, banks, etc. to meet the market demands. The interest rates are decided by the discounts quoted in these bids and these are market related rates.

In the primary market, RBI sells those Securities to Banks, Financial Institutions, PFs, Pension Funds, dealers etc. RBI as the underwriter of the Central Government Securities makes up any shortfall in subscription for them. But in the case of State Government and Semi-Government securities it arranges for subscription in full through use of its good offices with banks, but does not directly

subscribe to them.

In the secondary market, which is a retail market, trading is over the counter. Main operators other than the DFHI are Banks, FIs, PFs, Companies, etc. The RBI operates only in central govt. securities through the DFHI and Stock Trading Corporations of India (STCI) who may directly with Banks, FIs, etc.. or indirectly through the Brokers who are authorized to deal in this market by the RBI.

Both in the Primary and Secondary Markets, RBI has set up institutions to deal in these markets as market leaders, namely, DFHI and STCI. The underwriting activity of RBI is shared with a class of primary dealers who are authorised to be market makers by the RBI in the gilt-edged market.

The main Features of Primary Market in the government and semi-government securities are set out below.

5.2.1 PRIMARY MARKET OPERATIONS

1. New loans to be issued are decided by the government in consultation with RBI, as to the terms of issue, maturity cut off yields or coupon rates, etc.

2. The RBI acts as underwriter and contributes to the loans unsubscribed by the public; It is issue manager and Registrar. This work is now shared partially with a class of primary dealers.

3. The timing and conditions, the amounts involved are discussed by the RBI with banks and FIs, and sometimes prior commitments are enlisted from major banks.

4. The floatation of loans is effected throughout the year depending on the conditions of the market and requirements of Govt

5. The timing and amount of loans are adjusted as to the availability of bank funds and Statutory Liquidity Ratio (SLR) requirements.

6. The loans are contributed in terms of cash as also conversion of existing maturity loans.

7. The loan certificates are issued in the form of Promissory Notes or Stock Certificates. Issue of bearer bonds was discontinued since a long time.

8. The amounts required to be borrowed by the center and state governments are indicated in their budgets before the year starts and well before the borrowing operations are initiated leaving sufficient time for RBI to plan the issue, depending on the needs of the govt. and market conditions.

5.2.2 SECONDARY MARKETS IN GOVT. SECURITIES

The govt. securities market is a part of the overall stock market, although trading does not take place in the trading ring of the exchange. The market is a captive market confined to banks, FIs, PFs, etc. This is an over the counter market

(OTC). with trading by Telex. telephone. etc. The RBI conducts open market operations to stabilise the market and help the institutions. banks. etc operating in the market. Only since the 80s the interest rates in this market have been raised to more realistic levels in tune with the market trends. The operations in the market still continue to be confined to banks and FIs. and PF and Insurance companies. either directly with the RBI or through brokers in the market. Even today the market is limited in terms of the number of players and the brokers who act as intermediaries. As referred to earlier. the trade in this market is effected in person. telex. telephone. etc., among banks directly or through the brokers. As such. it is called over the counter market. In the proper trading with the RBI. called open market operation. only licensed brokers authorised by the RBI are permitted to deal with the RBI. These brokers are expected to resort the prices of securities dealt with by them to the stock exchange. The RBI does operations with brokers or directly with banks. financial institutions and other players in the market. The securities are quoted in major stock exchanges and NSE and trading in NSE is reported regularly. The RBI conducts open market operations in selected central govt. securities. which is published on a daily basis on all working days. Repos and switches and cash sales are allowed by RBI in these securities upto some limits an in Treasury bills also.

5.2.3 COMMERCIAL BANKS' OPERATIONS

Although Banks. LIC, GIC, are all bound by Law to invest a proportion of their deposits or funds in government and semi-government Securities in the Primary Market. they start operations in the Secondary Market immediately thereafter for disinvestment or

(a) to adjust their portfolio of these Securities to net outflows of funds.

(b) to improve their yields and

(c) to adjust the maturity pattern of their holdings to suit to the new issue of government securities and net outflows of funds.

Generally, the portfolio management of commercial banks involves a compromise between the maximising of return and minimising of risk. The investment portfolio of the banks is influenced by the various economic factors such as monetary policy, credit regulations, the outlook of the interest rates etc. Banks are generally unwilling to hold securities of long-dated maturities as they are sensitive to the risk or fall in the capital value although, in more recent years, they are holding them for yield consideration. If interest rates are likely to rise, banks will shift from medium to short and vice versa. From the banks' point of view, long-dated loans are not an ideal type of investment, as they are likely to have greater fluctuations in the capital values. Banks give support to long-dated loans first although they may disinvest them soon after in favour of high-yielding state loans and short dated loans. But PFs, Pension Funds, LIC, Insurance Companies, etc. Prefer investment in the long-dated loans for yield purposes. They acquire them as and when funds accrue to them by purchasing them from the banks in the open market or the RBI.

Banks' operations in govt. securities market are presently not motivated by considerations of a profit centre for the Treasury in this market or all the markets together. The expertise of banks has been not been traditionally in the field of portfolio management in the investments. Only recently, the treasury function in the markets has become a separate unit of profitability or profit making and emphasis is laid on the needed expertise for efficient portfolio operations in this market. As shown in

the chapter on commercial banks' treasury operations, banks' operations are aimed at adjusting the maturity yields on their portfolio of capital losses, imminent on their portfolio due to changes in coupon rates yields on fresh issues, from time to time.

5.2.3.1 BANKS AND GILT-EDGED MARKET

Banks and financial institutions are required to invest in govt. securities by statutory requirements. For example banks, have to invest as per SLR upto 31.5% of demand and time liabilities but the incremental SLR was reduced to 25% for government and semi-government securities. The contributions to the new securities floated are, therefore, only from banks and financial institutions, trust, PFs, etc., who have surplus funds or are required by law to invest in these securities. Due to the controlled rates of interest on these securities, these are not attractive for the general public to invest or hold. There is, therefore, no secondary market in the government securities. But banks, financial institutions and PFs trade in these securities to take advantage of the differences in prices between the primary and secondary markets, and to gain in yields or to secure a maturity distribution that they desire to have.

The portfolio requirements of investors are determined by the maturity pattern and yield pattern of their existing securities. They operate in the market to take advantage of the price and yield differentials. The price differential may exist due to the adjustments taking place between the primary and secondary markets in securities representing trading at wholesale and retail levels. The price differentials may also be due to the distance factor as between centres or due to the regional disparities in industrial development. The registration charges or stamp duties in

each State in respect of government securities are different besides, regional disparities may exist in industrial development leading to differences in PF accruals and hence in the demand for government securities as between the states.

5.2.4 BROKERS AND THE MARKETS

Brokers do not enter the initial issues market as the issue of government securities is underwritten in a monopolistic manner by the RBI. This system is replaced by Repos during the reforms since 1992. The government has removed this monopoly condition and kept open this market to brokers as in foreign countries. These are called primary dealers (PDs) referred to later in this lesson. Secondly most brokers do not act as dealers in government securities due to lack of financial backing to hold these securities. They mostly act as intermediaries between trading banks, financial institutions and PFs, etc. The brokers deal with the RBI as per the prices fixed in their buying and selling lists. Bilateral and triangular switches are put through with the banks by the RBI for which brokers act as intermediaries. The RBI fixes quota for each bank for these switch deals, with a view to preventing the banks from unloading low yielding bonds on the RBI. This system is replaced by Repos during the reforms since 1992. The financial institution and PFs are permitted to buy from the RBI their requirements of securities in terms of maturity and yields. There is a selected list of brokers called approved list of brokers of the RBI in each centre with which the RBI deals in government securities. The approved list is very restrictive in the sense that only a few with a proven record of government business and a large turnover in addition to their reputation for credit worthiness are enrolled as approved brokers. Their profit is limited in the Market due to low margins but operations are attractive due to larger turnover.

5.2.5 REPOS

For the first time in 1992-93, the central govt. raised its entire market borrowing through the auction system. Bids were invited and market determined rates are used for allotment of securities and deciding the cut off point for accepting bids. The cut off yields are based on the discounted prices for a par value of Rs. 100.

The first auction sales of repurchase agreement (Repos) for central govt's dated securities was made in Dec. 1992 to even out short-term liquidity in the banking system with a fortnightly make up period. These Repos are for periods ranging upto 14 days, as the fortnightly reporting of CRR requires the support of Repos. These Repos are used for sale of govt. securities with the agreement to buy back within a maximum period of 14 days.

These Repurchase agreements are abolished to pump in funds by the RBI to impart liquidity to the call money market. In such cases RBI purchases securities first with the agreement to sell them back at the end of the period. In Nov. 1995, the Repos were made for not less than 3 days and not more than 14 days, so that funds from Repos are not used for overnight call money among banks. In the case of Repos used in govt. securities market RBI first sells them to repurchase back at the end of the period to facilitate liquidity for short periods in the banking system.

5.3.6 REFORM IN THE GILT-EDGED MARKET

The system of switch quotas was dispensed with in April 1992 as it did not encourage the banks to depend on the market. In order to force them into the market and develop a secondary market in govt. securities, the RBI gave up this system.

Since 1992, the RBI has been offering for sale only a select number of central govt. scrips, which it gives in its list, instead of giving all the scrips in its portfolio, for its operations. Certain scrips are kept in the list for cash for providing total liquidity for at least a few scrips in central securities. These are some of the reforms in govt. securities markets adopted since the financial reforms started in 1991. After April 1992, 182-day Treasury bills were discounted, but in their place, the auction of new instruments of 364 day Treasury bills in a fortnightly basis was introduced. Another step towards active debt management operation by the RBI was the introduction of an auction scheme for issue of 91 day treasury bills for a predetermined amount. The interest rate is definitely higher than the fixed discount rate of 4.6% as used to be for long before. With this, there is no short-term govt. paper at a fixed rate of interest.

5.2.7 SYSTEM OF PRIMARY DEALERS

A system of primary dealers was introduced by the RBI in gilt-edged markets in 1995. Primary dealers in govt. securities in most advanced markets like the United States of America, Canada, the United Kingdom, France and Australia, are usually a select group of securities firms. They act as market makers for the securities. They are approved either by the central bank of the country or the Treasury.

Primary Dealers serve a number of purposes such as the following:

(i) Help placement of govt. securities in primary issues by committed participation in auctions;

(ii) Provide active secondary market in securities by giving two-way quotes;

(iii) Act as conduit for open market operations by the central banks and

(iv) Provide signals to central banks for market intervention.

Primary dealers enjoy certain privileges like maintenance of clearing balance with the central bank and participation in clearing, facility of borrowing bonds/ funds from the central bank, operating switches with the central bank, right to participate in securities auctions and access on an exclusive basis, to open market operations.

The Reserve Bank announced on March 29, 1995 guidelines and procedures for enlistment of primary dealers in govt. securities market. The broad features of the guidelines are:

(a) The eligibility is based on the considerations that primary dealers should have strong capital base and experience in dealings in securities. Thus, subsidiaries of scheduled commercial banks and all-India financial institutions and companies incorporated under the companies Act, 1956 dedicated predominantly to the securities business in particular to the Government securities market and having net owned funds of a minimum of Rs. 50 crores will be eligible to apply for primary dealership.

(b) A primary dealer will be required to have standing arrangement with

the Reserve Bank based inter alia on the execution of an undertaking to (i) have a commitment to bid for a minimum amount in Central Government dated securities and Treasury bill auctions during a year and to maintain success ratios of 33.33 per cent and 40 per cent respectively. (ii) Underwrite accepted bids against notified amounts. (iii) Offer two-way quotes for govt. securities. and (iv) achieve an annual turnover of not less than 5 times in govt. dated securities and 10 times in treasury bills. These would ensure that they are committed to market making and are consistent and successful in their participation in auctions.

(c) The primary dealers shall maintain the minimum capital standards on risk weighted basis. Risk weights have been prescribed for govt. securities to take care of position risk arising out of dealing in securities. While in other countries such requirements have been prescribed as 'margins' in India risk-weighted system has been used to make it harmonious with capital adequacy standards for non-banking financial companies.

(d) The Reserve Bank would extend to primary dealers facilities like Current account/subsidiary General Ledger (SGL) account liquidity support linked to bidding commitments, freedom to deal in money market instruments 'and a favoured access to open market operations. These are vital for effective functioning of primary dealers.

(e) Primary dealers would be subject to the Reserve Bank regulation. They would be required to submit periodic return as prescribed by the Reserve

Bank and to provide to the Reserve Bank access to all the records, books and documents as may be required.

Unfortunately the above guidelines are too stringent and RBI does not provide refinance or liquidity to PDs with the result that there are not many takers for the scheme by the end of 1995. However with some liberalisations six primary dealers were registered with RBI by Sept. 1996.

5.2.8 FINANCIAL REFORMS AND GILT-EDGED MARKET

Gilt edged market is closely related to reforms in the banking sector, as the bulk of the demand for govt. sector securities arising out of the banking sector following the Narasimham Committee recommendations, the SLR and CRR of banks have been reduced from April 1992. With the gradual reduction in SLR in stages, the effective SLR is reduced to 31.5% and CRR to 12% (as at end Sept. 1996) and further to 10% by Jan. 1997. The freeing of their lending rates and other liberalisation measures boosted the financial markets.

Following the securities scandal of 1991-92, some further reformed were introduced in 1992, Banker Receipts (BR) in Govt. securities are not permitted where the SGL facility is available. In cases where BR is permitted, it is only for ready deals. Ready forward deals through BRs are prohibited in govt. securities, Treasury bills etc.

Effective from June 22, 1992, RBI issued new guidelines for dealings in Govt. securities for banks and brokers. All inter bank ready forward deals are prohibited in Govt. securities, PSU bonds, UTI units. Where SGL facility is available, all

deals should be put through the SGL only. Bank receipts in lieu of physical certificates only for ready deals under certain specific conditions such as delivery from another centre, or where allotment advice is there but certificates are not issued etc. Where there are no stocks with the SGL, no deals are allowed and banks should make sure of their position in the SGL. No ready forward or double ready forward deals are permitted in any securities or bonds even for a client's account or in Portfolio Management System. The operations in SGL, the transfer forms and the procedures have been streamlined to eliminate all malpractices of short sales or wrong entries. The banks have been advised to strengthen their internal Control system. The Reporting and monitoring has to be supervised by qualified inspectors and auditors. The top management is held responsible for inspection and monitoring. Similarly restrictions have been imposed on the deals to be put through by the brokers and business is to be distributed through as many brokers as possible.

The rates on Government securities were enhanced to make them market related rates. With a view to developing an active market in Government securities, the dependence of the Government on the market is increased and its dependence on RBI and banks reduced. The system of auctioning of Government securities was introduced in 1992 to allow the rates to reflect the true market conditions. The Central Government securities were sold on auction basis in respect of 5 year and 10 year loans in June and August 1992 respectively and this practice continued, which were referred to earlier.

The RBI reforms in govt. securities market, the setting up of STCI and the licensing of some primary dealers to act as market makers in gilt-edged securities have helped to reform the market. The PDs as also the commercial banks are expected to develop the secondary retail market in gilts, whose rates have now become market

related rates. The streamlining of RBI's depts. and of practices and procedures have also strengthened the market. The banks/and corporates have now started operating more frequently than before due to the provisioning requirement. of banks. capital adequacy norms to be adjusted for risk bearing assets due to the need for supervision of depreciation on gilted portfolio of current nature of banks' investments. The retail market in gilts is expected to develop soon following these reforms.

5.2.9 TRANSACTIONS IN GOVT. SECURITIES

Table 5.1 gives the turnover in govt. securities market at face value at Mumbai.

TABLE 5.1 TURNOVER IN GOVT. SECURITIES (Rs. crores)

Week/Month	Govt. of India Dated Securities	State Govt. Securities	Treasury Bills			RBI
			14 Day	91 Day	364 Day	
1	2	3	4	5	6	7
1998-99						
April	26,711.38	115.54	646.40	472.50	4,965.60	223.01
May	26,915.08	591.68	1,235.62	668.08	3,008.56	32.95
June	12,305.62	187.98	785.50	779.00	2,033.54	14.11
July	20,443.51	16.90	3,084.47	1,969.95	3,562.78	1,442.24
August	32,540.00	238.00	3,184.40	1,287.44	2,297.10	6,898.88
Week Ended						
Sept. 4, 1998	3,739.23	85.15	30.00	457.14	186.52	542.64
Sept. 11, 1998	3,134.27	111.35	20.00	271.92	208.70	103.70
Sept. 18, 1998	2,492.44	86.96	-	369.54	820.50	3.16
Sept. 25, 1998	2.550.32	0.32	50.00	297.73	617.18	0.46

Table 5.2 gives the secondary market transactions in Govt. securities.

TABLE 5.2 SECONDARY MARKET TRANSACTIONS IN GOVT. SECURITIES (FACE VALUE)

(Rs. Crores)

Week ended	Government of India securities (Maturing in the year)			State Govt. Securities	Treasury Bills		
	1999-00	2001-02	2008-09		14 Day	91 Day	364 Day
1. September 04,1998							
a. amount	99.10	547.94	62.20	47.57	15.00	228.57	93.28
b. YTM							
Min.	9.8321	11.4505	12.0045	12.0193	7.9765	5.9847	8.8759
Max.	10.5226	11.8789	12.1974	12.3721	7.9785	9.8229	10.2222
2. September 11,1998							
a. amount	115.93	436.00	270.93	55.67	10.00	135.96	104.35
b. YTM							
Min.	10.2570	11.5107	12.1271	11.9564	7.9788	5.4798	8.4763
Max.	10.7133	11.6702	12.2498	12.2119	7.9786	9.1248	9.7234
3. September 18,1998							
a. amount	131.00	347.00	42.03	43.48	-	184.77	410.25
b. YTM							
Min.	10.2439	11.5374	12.1250	12.2573	-	5.7348	7.8274

Max.	10.7639	12.0105	12.2748	12.3544		9.6745	9.7237
4. September 25,1998							
a. amount	153.89	329.50	146.43	0.26	25.00	148.86	308.59
b. YTM							
Min.	10.2068	11.4100	11.9949	12.1127	8.2269	4.9895	7.0807
Max.	11.1265	11.8174	12.2738	13.0130	8.2274	9.4739	9.7233

YTM : Yield To Maturity

5.3 SIGNIFICANCE OF GOVT. SECURITIES MARKET

Govt. securities market is intended to enable governments to raise funds to meet developmental and non-plan works. Fiscal deficits are the order of the day. To fund the fiscal deficits governments have to borrow from banks, FIs, LIC, GIC, etc and RBI. To ensure that demand for the Govt. securities exists, the Govt. securities market has to be developed in an orderly fashion. And the RBI is entrusted the job. Prior to 1991, RBI simply enabled the governments to meet their deficits by funding through deficit financing and SLR requirements. Now things are different. Govt. securities market is integrated with the money and capital market through reduced SLR requirements and offering interest rates equal to market rates of interest and sale of securities through open auction. Such integration is necessary for fulfilling monetary policy goals of the central bank.

Growth without undesirable level of inflation is the goal of monetary policy. By limiting, timing and shaping government borrowings and redeeming the same, RBI ensures that Govt. borrowings and servicing the same do not fuel inflation or

cause misallocation of resources. In turn, the holders of government securities must not feel chocked up with unsaleable securities. So, secondary market in the government securities is a must and the same is also created by the RBI. The cost of borrowings to the Govt. and yield on securities to the holders of the govt. securities must reflect market risk-return parity. And the same is also ensured. The operations of market intermediaries should be transparent so that no untoward happenings like the 1991-92 securities scam recur. The RBI has to ensure this too. And RBI has formed Board for financial supervision to supervise market operations of intermediaries. Also has strengthened the PDO. The establishment of STCI in 1994 and DFHI in 1988 were to assist the RBI in the task of floating Govt. securities, providing liquidity in the market and the like.

QUESTIONS

1. Explain the nature and forms of Govt. securities market and instruments thereof.
2. Discuss the systems of primary and secondary market segments in the gilt-market.
3. Bring out the role of RBI in the Govt. securities market.
4. Assess the significance of the Govt. securities market.
5. Explain the trends in the Govt. securities market since 1992.

REFERENCES

1. Treasury Management in India - V.A.AVADHANI
2. RBI Bulletin various Issues

UNIT VI - OPTIONS MARKET

In this lesson, concepts of options & option market, types of option, value of option, valuation of option at expiration, profits and losses on calls and puts, pay-offs of certain option strategies and index options are dealt with.

6.1 CONCEPT OF OPTIONS

Options are derivatives of financial products like shares, share index, etc. These are called derivatives, because they derive their value from the underlying financial product, viz; a share, a foreign currency and so on.

An option is, as everyone knows, a right to do or refrain from doing certain thing. Normally in any trading, two parties are involved - a seller and a buyer. The seller agrees to sell and the buyer agrees to buy. The seller is under obligation to sell and the other is under obligation to buy. Can there be any transaction with the seller having obligation to sell, while the buyer having only an option (or right) but not obligation to buy? Yes. Such transaction is precisely an option transaction.

In an option transaction one party, known as the writer of the option, sells (hence a.k.a seller) an option to the other party (known as the holder or buyer of the option) to buy or to sell or to either buy or sell or both buy and sell, as the case may be a specified asset, of specified quantity at a specified price, delivery given/taken (if need be) on a or within specific future date.

Say 'S' the seller is giving a option to "B" the buyer of the option, whereby 'B' is entitled to but not under obligation, buy 100 shares of XYZ Ltd. at Rs.100

each. This is known as call option. If "B" is given the option to (but not obligation) sell 100 shares of XYZ Ltd. at Rs. 100 each, such option is known as put option. If "B" is given the option to (but not obligation) either buy or sell 10 shares of XYZ Ltd. at Rs.100 each, then the option is call and put option. The price viz Rs.100 per share is known as the strike or exercise price. If the option is exercisable anytime within the stipulated ate, it is known as American option and if it is exercisable only on the stipulated date, it is known as European option. From the words "American and European" it is evident, option trading originated in the West. Of course now in the developed Asian nations, option trading is practised.

Option trading is not confined to stocks. In commodities market, in the foreign exchange market, in the finance market, etc. option trading is carreid on. Option trading is standerdised as to size, time, etc. and the options exchange (like stock exchange) interposes between the writer and holder of options so that each party settles the deal to the exchange. And this adds credibility.

VARIETIES :

On the basis of objectives, options trading can be for hedging or speculative purposes. On the basis of the underlying financial asset, ptions can be classified as scrip or stock options, commodity options, currency options and futures options. On the basis of primary forms, options can be çall, put and call and put. And there are several high-breed options as well. This papers deals with varieties of stock options.

6.2 OPTION MARKETS

Option markets are two types Exchange traded and over-the-counter traded options exist. The former option markets are exchanges where options are traded. Options are traded in organised option exchanges. Chicago Board of Options Exchange (CBOE) is an established options exchange in the USA. Besides CBOE, American, Pacific, Philadelphia and New York stock exchanges deal in options in the US. London Stock Exchange, Tokyo Stock Exchange, etc deal in options. The latter market, ie., over-the-counter dealt by banks. In the emerging markets, options are traded in exchanges only.

In the USA, options are traded in standardised contracts. The Options Clearing Corporation (OCC), a company that is jointly owned by several exchanges, greatly facilitates trading in these options. It does so by maintaining a computer system that keeps track of all of these options by recording the position of each investor in each one. Although the mechanics are rather complex, the principles are simple enough. As soon as a buyer and a writer decide to trade a particular option contract and the buyer pays the agreed-upon premium, the OCC steps in, becoming the effective writer as far as the buyer is concerned and the effective buyer as far as the writer is concerned. Thus at this time all direct links between original buyer and writer are severed. If a buyer chooses to exercise an option, the OCC will randomly choose a writer who has not closed his or her position and assign the exercise notice accordingly. The OCC also guarantees delivery of stock if the writer is unable to come up with the shares.

The OCC makes is possible for buyers and writers to "close out" their positions at any time. If a buyer subsequently becomes a writer of the same contract, meaning that the buyer later "sells" the contract to someone else, the OCC computer will note the offsetting positions in this investor's account and will simply cancel both

entries. Consider an investor who buys a contract on Monday and then sells it on Tuesday. The computer will note that the investor's net position is zero and will remove both entries. The second trade is a **closing sale** because it serves to close out the investor's position from the earlier trade. Closing sales thus allow buyers to sell options rather than exercise them

A similar procedure allows a writer to pay to be relieved of the potential obligation to deliver stock. Consider an investor who writes a contract on Wednesday and buys an identical one on Thursday. The latter is a **closing purchase** and, analogous to a closing sale, serves to close out the investor's position from the earlier trade.

Exchanges begin trading a new set of options on a given stock every three months. The newly created options have roughly nine months before they expire. For example, options on Widget might be introduced in January, April, July, and October, with expiration dates in, respectively, September, December, March, and June. Furthermore, the exchange might decide to introduce long-term options on Widget (dubbed LEAPS by the exchanges for long-term equity anticipation securities) that expire as far into the future as two to three years.

Generally, two call options on a stock are introduced at the same time, the two being identical in all respects except for the exercise price. In terms of the exercise price, if the stock is selling for $200, or less at the time the options are to be introduced, then the two exercise prices will be set at $5 intervals bracketing the stock price. Furthermore, a pair of put option contracts may also be introduced at the same time. For example, if Widget is selling for $43 in January, then two September call options may be introduced that have exercise prices of $40 and $45

Similarly, two September put options with exercise prices of $40 and $45 may also be introduced.

After an option has been introduced, new options having the same terms as the existing ones but with different exercise prices may be introduced when the stock price of the company moves up or down so much that it is substantially outside of the initial bracket. In terms of Widget, if its stock price rises in the next month to $49, perhaps September put and call options having a $50 exercise price will be introduced.

Once listed, an option remains listed until its expiration date. Specifically, listed options on common stocks generally expire at 10:59 P.M. Central Time on the Saturday after the third Friday of the specified month.

There are two types of exchange-based mechanisms in the United States for trading option contracts. The focal point for trading involves either specialists or market-makers as will be discussed next.

USE OF SPECIALISTS

Trading on stock exchanges centres on specialists. These people serve two functions, acting as both dealers and brokers. As dealers they keep an inventory of the stocks that are assigned to them and buy and sell from that inventory as bid and asked prices, respectively. As brokers they keep the limit order book and execute the orders in it as market prices move up and down. Some option markets, such as the American Stock Exchange, function in a similar manner. These markets have specialists who are assigned specific option contracts, and these specialists act as

dealers and brokers in their assigned options. As with the stock exchanges, there may also be **floor traders**, who trade solely for themselves, hoping to buy low and sell high, and **floor brokers**, who handle orders from the public.

USE OF MARKET-MAKERS

Other option markets, such as the Chicago Board Options Exchange, do not invoke specialists. Instead they involve **market-makers**, who act as dealers, and **order book officials** (previously known as broad brokers), who keep the limit order book. The market-makers must trade with floor brokers, who are members of the exchange that handle orders from the public. In doing so, the market-makers have an inventory of options and quote bid and asked prices. Whereas there is one and only one specialist typically assigned to a stock, there usually is more than one market-maker assigned to the options on a given stock. Furthermore, a market-maker is prohibited from handling public orders in his or her assigned options but may handle public orders in other options. That is, market-makers can also act as floor brokers, but only in unassigned options.

The order book official, in keeping the limit order book, is not allowed to engage in any trading. Unlike the specialist, the order book official's limit order book can be shown to other members of the exchange. The order book official stands at the trading post for those options that are his or her responsibility. All orders must be executed by means of an auction at the trading post with "open outcry", meaning that the auction is conducted orally.

Like the organized stock exchanges in the United States, all option exchanges are continuous markets, meaning that orders can be executed any time the exchanges

are open. However, actual trading in options is, on occasion, far from continuous. In the financial press it is not unusual to find prices for various options that appeai to be "out of line" with one another or with the price of the underlying stock. It should be remembered that each listed price is that of the last trade of the day, and that these trades may have taken place at different times. Apparent price disparities may simply reflect trades that occurred before and after major news. rather than concurrent values at which obviously profitable trades could have been made.

COMMISSIONS

Whereas a commission must be paid to a stockbroker whenever an options is either written, bought, or sold, the size of the commission has been reduced substantially since options began to be traded on organized exchanges in 1973. Furthermore, this commission is typically smaller than the commission that would be paid if the underlying stock had been purchased instead of the option. This is probably due to the fact that clearing and settling are easier with options than with stocks (with options there are no share certificates that have to change hands with every trade) and that the order size is smaller (the total dollar amount paid for the option is much less than the total dollar amount of the underlying stock).

However, the investor should be aware that exercising an option will typically result in the buyer's having to pay a commission equivalent to the commission that would be incurred if the stock itself were being bought or sold.

MARGIN

Any buyer of an option would like some assurance that the writer can deliver

as required if the option is exercised. Specifically, the buyer of a call option would like some assurance that the writer is capable of delivering the requisite shares, and the buyer of a put option would like some assurance that the writer is capable of delivering the necessary cash. Because all option contracts are with the OCC, it is actually the institution concerned with the ability of the writer to fulfil the terms of the contract.

CONTRACT SPECIFICATIONS: OPTIONS ON PHYSICALS

	Individual Stocks	**S & P 100 index**
i Exchange	CBOE	CBOE
ii. Trading hours	9.30 am to 4.10 pm	9.30 am to 4.10 pm
iii. Underlying asset	Common stocks listed on the NY stock Exchange and the American Stock Exchange, and qualified securities traded over the counter.	S & P 100 stock index (Cash settled)
iv. Contract months	Two nearby months, plus quarterly months of Mar, Jun, Sep and Dec. cycles are extended eight months out.	Four nearby months
v. Minimum price fluctuation	1/16 or $6.25 per contract	1/16 or $6.25 per contract
vi. Strike prices	Vary among stocks (usually $5.00 or $2.50 interval)	5 index point interval

vii. Daily price limit	None	None
viii Speculative position limit	Depends on a given stock's outstanding shares and volume	25,000 contracts, but no more than 15,000 contracts in the front month
ix. Last trading day	Third Friday of an expiring contract month	Third friday of an expiring contract month
x. Exercise	American	American

6.3 VALUE OF OPTIONS

The value of an option is related to the value of the underlying security in a manner that is most easily seen just prior to expiration (which for simplicity will be referred to as "at expiration"). Figure relates the value of a call option with an exercise price of $100 to the price of the underlying stock at expiration. If the stock price is below $100, the option will be worthless when it expires. If the price is above $100, the option can be exercised for $100 to obtain a security with a greater value, resulting in a net gain to the option buyer that will equal the difference between the security's market price and the $100 exercise price. However, there is no need for the option buyer to actually exercise the option. Instead, the option writer can simply pay the buyer the difference between the security price and the $100 exercise price, thereby allowing both parties to avoid the inconvenience of exercise. This is commonly done for listed options (by using the services of the OCC), although a minority of investors choose to exercise their options, possibly for tax purposes.

Figure shows the value at expiration of a put option with an exercise price of \$100. If the stock price is above \$100, the option will be worthless when it expires. If the price is below \$100, the option can be exercised to obtain \$100 for stock having a lower value, resulting in a net gain to the option buyer that will equal the difference between the \$100 exercise price and the stock's market price. As with a call option, neither the put option buyer nor the writer need actually deal in the stock. Instead, the writer of any put option that is worth exercising at expiration can simply pay the buyer of the option the difference between the stock price and the \$100 exercise price.

In both panels of Figure, the lines indicating the value of a call and a put at expiration can also be interpreted to be the value of a call or a put at the moment the option is exercised, no matter when that occurs during the life of the option. In particular, for calls the kinked line connecting points O, E and Z is known as the **intrinsic value** of the call. Similarly, for puts the kinked line connecting points Z, E, and \$200 is known as the intrinsic value of the put.

The kinked lines representing the intrinsic values of calls and puts such as those shown in Figure can be expressed as IV_c and IV_p, respectively, as follows:

$$IV_c = \max (O, P_s - E)$$
$$IV_p = \max (O, E - P_s)$$

where P_s denotes the market price of the underlying stock and E denotes the exercise price of the option. (Here max means to use the larger of the two values in brakets).

Consider the call option in Figure. Its intrinsic value, according to Equation, is max (O, P_s - \$100) because its exercise price is \$100. Note that for any market price of the stock that is below \$100, such as \$50, its intrinsic value is max (O, \$50 - \$100) = 0. Hence $IV_s = 0$ in such situations. Next imagine that the market price of the stock is above \$100, for example, \$150. In this situation its intrinsic value is max (O, \$150 - \$100) = \$50. Hence $IV_c = P_c - E$. Thus the kinked intrinsic value line has its kink at E, as it has two components that meet there: a horizontal line going through the origin-out to the value E, and then a 45-degree line (and therefore having a slope of 1) going northeast from E. Similar analysis reveals that the kinked intrinsic value line for the put also has its kink at E, as shown in Figure.

Calls and puts will not sell for less than their intrinsic values, owing to the actions of shrewd investors. If an option sold for less than its intrinsic value, then such investors could instantaneously make riskless profits. For example, if the stock price was \$150 and the call was selling for \$40, which is \$10 less than its intrinsic value of \$50, then these investors would simultaneously buy these calls, exercise them, and sell the shares received from the writers. In doing so they would spend \$140 on each call and exercise price and get \$150 in return for each share sold, resulting in a net riskless profit of \$10 per call. As a consequence, the call will not sell for less than \$50 if the stock price is \$150.

6.4 OPTION PRICING

Holder of option books 'gains', but leaves 'pains' to the option writer. But option writer must get some "quid pro quo". And that is the commission, price or premium, called by all these terms, paid upfront by the holder of option to its writer. Option pricing or valuing is all about finding the value of an option at the time it is

written so that the same can be bought and sold. Today, the value of traded stock based options a day is put at $ 148 bn. and daily trades run to over a million in number from only 911 on the first day of option trading in the Chicago Board of Options Exchange way back in 1973, the year when the 1997 nobel laureates Prof. Morton published his "Theory of Rational Option Pricing" and Prof. Scholes (along with now slain Prof. Black) published their "the pricing of options and corporate liabilities". Their models are now used by millions of option writers and holders. But for their work, options market would not have reached its stature it enjoys today. The world of derivatives owes much to these path finders a lot.

Even to many finance people options and derivatives are still not a commonplace subject; not to speak of the commonman. Yet it can be made very simple.

Take the case of H Ltd share. Today (Oct. 1997) the share goes at Rs. 1410. By March, 6 months from now, feels it will touch Rs. 1600. He wants to benefit from the price movement and for that he must invest today Rs. 1410 in a H Ltd share. And he is not having that much money. Even if he has money, if the March 1998 price of H Ltd shares goes down or does not rise to the expected level, X will lose. If Y offers X the right to buy a H Ltd share at, say Rs. 1500 but not obligation to buy, for a front-end, ie; at current, commission of Rs. 80. X can willingly buy that option. Because, X's present outlay on the option bought is only Rs. 80. By March 1998, if H Ltd share goes beyond Rs. 1500 he can exercise the option and book gains. If it goes below Rs. 1500, X can allow the option to lapse and his loss will be the upfront commission paid Rs. 80. The logic of the upfront commission paid Rs. 80 or any figure is what the nobel laureates established. They evolved the formula for finding the value (ie., the price, ie; the commission) of options.

Option pricing: Black - Scholes Model

More information is called for to price an option. Let us continue the H Ltd stock, whose current price (P) is Rs. 1410 and 6 month's option related price. E, (known as exercise price) be Rs. 1500 as previously assumed. The period of option is 6 months which is to be expressed as a fraction of a year, T, so 6/12 = 0.5. Let risk free rate of return (R), which has to be continuously compounded. (ie: say every day compounded), be 10% or 0.1. The std. deviation of continually compounded annual rate of return of the H Ltd stock (S), say is 25% or 0.25.

With these, we can calculate two measures, viz, d_1 and d_2 used in Black - Scholes model of option valuation. The formula for d_1 and d_2 are:

$d_1 = [\ln (P/E) + (R + 0.5S^2)T] / S(T)^{0.5}$ and

$d_2 = d_1 - S(T)^{0.5}$, where ln is natural logarithm.

Putting the values of P, E, R, S and T we get:

$d_1 = [\ln(1410/1500) + (.1 + (.5 * .25 * .25).5]/(.25)*(.5)^{0.5}$
$= [-0.06194 + 0.06563] / 0.17678$
$= 0.02085$

$d_2 = 0.02085 - .25(.5)^{0.5}$
$= 0.0209 - 0.1768$
$= -0.1559$

V_c = Value of a call option (that is what we are currently dealing with) is given by:

$$V_c = N(d_1)\,P - N(d_2)\,E / e^{RT}, \text{ where,}$$

$N(d_1)$ and $N(d_2)$ are cumulative normal distribution function of d_1 and d_2, e = base of natural logarithm = 2.7183. We know P and E and R and T. $N(d_1) = N(.02085) = 0.51$ and $N(d_2) = N(-.1559) = 0.436$, $e^{RT} = 2.7183^{0.05} = 1.052$

$$\text{So, } V_c = .51 * 1410 - (.436 * 1500) / 1.052$$
$$= 719 - 622 = 97$$

If the price is less than the value (ie. Rs. 97), the call option has to be bought. Earlier we made that the call option is going at Rs. 80. Therefore, the call option is underpriced. So, it is better to buy a call option. If the price is more than Rs. 97, the value of option, it is better to go for selling, that is writing a call option and gain.

STATIC ANALYSIS

Static analysis presents, when a particular variable is changed, keeping other variables constant what will happen to the option premium. These are 5 variables, viz. P, K, R, T and S. Earlier he have computed that the value of a call option on II Ltd share comes to Rs. 97. If, the "P", ie., current price of the scrip rises to Rs. 1455 from the present Rs. 1410, other factors remaining same, we can show that the call option premium goes to Rs. 107. Keeping others constant, but rising the 'E' ie., exercise or strike price to Rs. 1590, the value of call option goes down to Rs. 71. If R is risen to 15%, instead the present 10%, keeping others constant, V_c rises to Rs.

121. When "S", ie., std. deviation of return of return on underlying stock is risen to 30%, V_c rises to 131. And when 'T' is risen to 9 months, ie., T = 0.75, V_c rises to Rs. 108. A decrease in these 5 variables will have opposite effects on call option value.

The following is the tabulation of effects of increase in different variables under static conditions (ie., one variable is changed at one time, keeping the rest constant) on call and put options:

Variables	Effect of increase in variables given in column one on value of	
	Call option	Put option
Current price = P	Increase	Decrease
Exercise price = E	Decrease	Increase
Risk of asset = S	Increase	Increase
Time to expiry = T	Increase	Increase
Risk free return = R	Increase	Decrease

If may be noted that changes in P, E and R have opposite effects on call and put options, while changes in S and T have same type effect on values of both calls and puts.

ASSUMPTIONS OF BLACK - SCHOLES METHOD

The Black - Scholes method of option value determination is subject to certain restrictive conditions. The underlying asset cannot give dividend or interest income, the option has to be European which can be exercised only on expiration, risk-free rate of return is constant over time, the underlying asset's continually compounded

annual returns are normally distributed with a static mean and std. deviation, all markets are perfect and short selling of securities with full use of proceeds is permitted are the restrictive conditions.

These conditions are restrictive indeed. But researchers on the empirical utilities of B-S model have established that the B-S model is quite robust even when some of the restrictive conditions are relaxed, the B-S model can be used to price European options on dividend paying stocks, provided the stock price is reduced by the present value of future dividends receivable during the life of the option (discounted at the risk-free rate from the ex-dividend rate). American call options (which can be exercised any time during currency of the same) of non-dividend paying stocks, can be valued using B-S model, as such options one seldom exercised before expiry date because realisations are less than optimal.

PRICE DETERMINENTS

The price of the option, ie., the upfront commission payable by the option buyer (ie., option holder) to the option writer (ie., option seller), a.k.a premium, has to be fixed. And it has to be big enough to induce many to become option writers and small enough to induce many to become option holders. So it has to be a balanced one.

There are different factors that influence the premium level. The market price of the underlying asset is important factor. If it is a big ticket stock, option premium will be higher and vice versa. Because, with high priced assets, if the option is exercised the option writer's loss will be higher. Hence higher premium. The time to maturity is the next factor. Longer term option indicates higher risk as the chances

for option being exercised are more and that option writers charge higher premium. The third factor is the price and return volatility of the underlying assets. If the volatility is higher. risk is higher. So high premium is the order. Fourth. the exercise price comes. Normally, the exercise price is related or equated to the market price when to option is executed. In a call option, if the exercise price is a bit higher than the market price at the time of option contracting. probably the option may not be exercised and hence the eventuality of the option writer losing on the contract is remote and hence he can charge a lower premium. In the case of a put option. if the exercise price is bit lower than the market price. when the contract is entered into. very likely option holder might not exercise it and that option writer can reduce his pay off by offering a lower put-commission. Fifth. the risk free rate of return. such as the treasury bill rate or bank rate, in the economy is another factor of importance. Premium on calls is in direct relation with risk less rate of return. That is. higher the risk less rate of return. higher premium charged. As stock prices are generally upward moving. a call writer is running the risk of the call being exercised. When the riskfree yield is high enough. why should he run behind holding the tiger's tail unless there is a chance to make a big bit. Hence the high premium. In put option. it is the option holder who loses, to the extent the upfront premium paid. when prices move up. as they generally do. To induce. therefore. people to buy put options. the premium has to be lower.

TRUE VALUE OF OPTION

All these above mentioned factors influence value and hence price of an option. What is the true value of an option at the time of writing or time zero or t_0? Binomial option pricing model (BOPM) is used to get this value.

To proceed with the analysis. we need to take 3 investment alternatives - the stock.

underlying option and a riskfree bond. Take current stock price and exercise price as Rs. 200. Say it can go up or down by 25% by the expiration of option, one year from now.

Let the risk-free yield on bond, whose current price is Rs. 200 be 8% p.a. which after daily compounding or continuous compounding, yields 8.33% p.a. So, the bond grows to Rs. 216.67 one year from now, current price being Rs. 200. The call option holder will exercise option when the price of the underlying stock moves to Rs. 250 (ie., 25% rise) and its value then is Rs. 50. If price goes down it is worthless. The current price of option is not known. We have to find this out : The above presented factors can be presented as follows in a tabular form as below:

Instrument	Payoff in up state (i.e. price rises)	Pay off in down state (price falls)	Exercise and current price
Stock	Rs. 250	Rs. 150	Rs. 200
Riskfree bond	Rs. 216.67	Rs. 216.67	Rs. 200
Call option	Rs. 50	0	?

The characteristics of the call option can be replicated with a portfolio comprising the stock and risk free bond. Then the cost of replicating the portfolio is the value of the call option. We have to decide the composition of the portfolio such that it replicates the pay offs of the call option. Let "S" be number of stocks and "B" be the number of bonds comprising the portfolio.

When when the 'up state' prevails,

Rs. 250 S + Rs. 216.67 B = Rs. 50 (1)

When the down state prevails

Rs. 150 S + Rs. 216.67 B = Rs. 0 (2)

Subtracting, (2) from (1), we get,

Rs. 100 S = Rs. 50

That is, S = .5. That is we have to invest .5 * 200 = Rs. 100 in the stock. So, at time zero we need Rs. 100 to get the stock.

Putting, S = 0.5 in equation (1) we get,
Rs. 125 + Rs. 126.67 B = Rs. 50

ie., Rs. 216.67 B = Rs. -75
ie., B = Rs. -75 / Rs. 216.67
= -225 / 650

Thus, B = -225/650. The negative sign indicates we have to sell bond that is, we have to borrow at the risk free rate a sum equal to 225/650 times Rs. 200 or Rs. 69.23 present.

The portfolio becomes, a leveraged portfolio thus, with Rs. 100 invested in the stock with a borrowed fund of Rs. 69.23, remaining being owned fund. And this

portfolio's return replicates the return of the call option in both the case of market state - upstate and down state as may be seen below.

Portfolio realisation	Pay off up state	Pay off down state
Sale of stock	Rs. 5 * 250 = 125	.5 * 150 = 75
Repayment of debt	Rs.69.23*216.67/200 = 75	69.23*216.67/200 = 75
Net position	Rs.125-Rs.75 = 50 = Value of call in up state	Rs.75-Rs.75 = 0 = Value of call in down state

To obtain this portfolio, which replicates the call option in either of the cases, we need Rs. 100 to buy the stock but can raise Rs. 69.23 through borrowing or Rs. 100 - Rs. 69.23 or Rs. 30.77. And this is the value of the call option premium is Rs. 30.77 at time zero.

Actually the call premium can be put at, $S * P_{0,5} + B * P_{0,6}$, where 'S' and 'B' are units of stock and bond an $P_{0,S}$ and $P_{0,B}$ are current prices underlying stock and underlying bond. We know, S = .5 and B = -25/650. Since $P_{0,S} = P_{0,B}$ = Rs. 200, we get,

Call premium = .5 * 200 - (225 / 650) * 200
= 100 - 69.23 = 30.77

The call premium thus equals the cost of buy-stock-borrow money strategy which has the same pay off of a call at time 'T'.

OVER PRICING AND UNDERPRICING

If a call option is overpriced, ie., going price is more than the value as per the above model, by writing a call one stands to gain. And if is underpriced, one gains by buying a call.

The work of Fisher Black, (who is no more now) and Myran Scholes, (the nobel winner now), "The pricing of options and corporate liabilities" first published in the journal of Political Economy (May/June 1973), presented the option pricing formula. Fisher also wrote "How we came up with the option formula" in 'Journal of Portfolio Management', (Winter 1989) and "How to use the Holes in Black-Scholes" in the Journal of Applied Corporate Finance (Winter 1989). The other Nobel winner, Robert C. Merton's work, "Theory of Rational Option Pricing" was published in "Bell Journal of Economic and Management Science", in spring 1973. All the three continued updating their models constantly so that derivatives pricing models become common place and generalised.

Black - Scholes model runs like this:

$V_c = N(d_1)\ P - N(d_2)\ E/e^{RT}$, where

$d_1 = [\ln (P/E) + (R + .5\ S^2)\ T] / S * T^{0.5}$

$d_2 = [\ln (P/E) + (R - .5\ S^2)\ T] / S * T^{0.5}$

$= d_1 - S(T)^{0.5}$,

V_c = Value of call option

P = Current market price of underlying stock

R = Continually compounded risk free rate of return on annual basis

E = Exercise price

$N(d_1)$, $N(d_2)$ = Cumulative normal distribution function of d_1 and d_2

T = Time till expiry of option, expressed as a fraction of a year

S = Std. deviation of continually compounded annual rate of return on the stock or simply risk.

e = base of natural logarithm = 2.7183

ln = natural logarithm to base e

Consider that a call option that expires in 6 months from now, hence T = 6/12 = 0.5, has an exercise price = E = 100, while its current price of the underlying stock = P = Rs. 90. Let the std. deviation of return on the stock = S = 20% = 0.2, Let R = 5% or 0.05.

Then d_1 $= [\ln(90/100) + (0.5+.5*.2*.2).5] / .2(.5)^{0.5}$

$= [-.106 + (.07)(.5)] / .2 * 0.0707$

$= [-.106 + .035] / .1414$

$= - 0.502$

d_2 $= d_1 - .2 * .0707$

$= -0.502 - .1414$

$= -0.6434$

$N(d_1) = N(-.502) = .3085$

$N(d_2) = N(-.6434) = .26$

V_c = (.3085) (90) - (.26 * 100/2.7183$^{0.5}$ * .5)
= 27.77 - (26 / 1.025)
= 27.77 - 25.37
= Rs. 2.40

The sum Rs. 2.40 is the call premium or value of option at time zero.

Certain broad conclusions can be made about the effect of individual variables over the call option premium or price given other variables. These are:

(i) higher price of the underlying stock, ie., P, higher is the value of call option
(ii) higher the exercise price, ie., E, lower the value of option
(iii) longer the time to expiration and higher the risk free rate, higher is V_c
(iv) higher the 'S', ie., risk, higher is V_c.

The Black - Scholes model can be used for valuing European options without any condition, but as to American options with the condition that the underlying stock is non-dividend paying. But most options are written on dividend paying shares. Another limitations is use of single 'R' for the entire 'T', whereas in reality riskfree rate varies over time. But later the now Nobel laureates had upstaged their model to deal with the initial infirmities.

HEDGE RATIO

We have seen that .5 shares of the specified company be bought and simultaneously Rs. 69.23 be borrowed to replicate call option pay offs. There is an easy way out to get the number of shares to be bought for the replicating portfolio.

This is given by the formula: $(P_{o,u} - P_{o,d}) / (P_{s,u} - P_{s,d})$, where $P_{o,u}$ and $P_{o,d}$ are pay offs of call option at up and down states and $P_{s,u}$ and $P_{s,d}$ are prices of shares at up and down stages. This is known as hedge ration, or 'h'.

h = (50 - 0) / (250 - 150) = 50/100 = .5

The amount of borrowing is decided as follows:

Amount of Borrowing = PV ($h.P_{s,d} - P_{o,d}$), where
PV = present value of the factors involved
$h.P_{s,d}$ = value of share portfolio in downstate
= .5 * 150 = Rs. 75

$P_{o,d}$ = Pay off of option in down state = 0.

Amount of Borrowing = PV of Rs. 75, at a discounting rate of 8.33%, which is the annual return on a continuously compounded risk free rate of return of 8% = 75/1.0833 = Rs. 69.23.

Therefore the call option premium is simply
(No. of stock * Present Stock Price) - Borrowing = (.5*200)-69.23 = Rs. 30.77

VALUING PUT OPTION

So far we dealt with valuing call option. Put option can be valued similarly. Let the current price of a stock and underlying exercise price of put option be Rs. 200 and the up state price is Rs. 250 and down state Rs. 150. A replicative portfolio

of short selling shares and investing in risk free bond giving 8.33% p.a is to be constructed. Shares to be sold short in the protective put option (n_p) is simply n_c - 1 = n_p, where n_c is the no. of shares to be bought in a call option of some duration as the put option of the same stock.

In our case we get that

n_p = .5 - 1 = -.5. And here, the minus sign indicates selling of 0.5 share. The amount to be invested in risk free bond is = PV(n.$P_{s,d}$ - $P_{o,d}$).
= PV (-.5 * 150 - 50) = PV (-125) = Rs. -115.39. ($P_{s,d}$ = price of stock in down state = Rs. 150 and $P_{o,d}$ = pay off on put option in down state = Rs. 50, selling price under option - market selling price = Rs. 200 - Rs. 150 = Rs. 50). The minus sign in Rs. -115.39, means money has to be spent on risk free bond. And 0.5 share sold at current price will fetch Rs. 0.5 * 200 = Rs. 100. Thus, an inflow of Rs. 100 and an outflow of Rs. 115.39 are involved, resulting in a net outflow of Rs. 15.39 at present w.r.t the replicating portfolio. And this sum Rs. 15.39 is the value of the put option.

PUT-CALL PARITY: TO BUY A PUT OR A CALL?

We have computed values of put option and call option on a given scrip having some exercise price and duration. Now the question: Is these any relationship between put premium and call premium? Yes. There is.

You buy a call, paying Rs. 30.77 now. On expiration date as expected stock price goes up and you have to buy the stock paying Rs. 200 then. To have Rs. 200 by one year from now, you have to invest now in a risk free bond, giving 8.33% continuously compounded rate of return. That is, now you have to invest in bond

Rs. 184.62. So total cost of buying a call and risk free bond investment = Rs. 30.77 + 184.62 = 215.39.

Alternatively, you buy a put paying Rs. 15.39. This is a right to sell. To sell later you have to buy now the shares. And for this you need Rs. 200. Total cost = Cost of put + Cost of stock bought = Rs. 15.39 + Rs. 200 = Rs. 215.39. The pay offs of both alternatives at maturity are same. You notice that the cost of the two strategies are same, Rs. 215.39 each. This is known as put call parity. What is the lesson? We can go for either buying a put or call, but each must be married to an investment in appropriate "spouse" asset. For a put option the spouse happens to be buying underlying share. For a call option the spouse happens to be investment in risk free bond.

6.5 PROFITS AND LOSSES ON CALLS AND PUTS

CALL OPTION :

A call option is an option to buy, and not obligation a to buy stock at the agreed exercise price (EP) by or within a specified date. Say, A gives B an option to buy a RIL share for Rs.400 by 3 months from now, for an upfront commission or premium of Rs.20 payable now. Three months later if RIL share price (LP) is higher than Rs.400, B will exercise the option. If it goes below or remains at Rs.400, B will allow the right he has unexercised. His gain is maximum of (LP-EP), 0. How is this useful to B? B benefits when RIL share goes up beyond Rs.400. Otherwise, his loss is limite to the Rs.20 upfront commission paid. In the following table 1 the pay offs of call option are presented for different price levels of RIL share in 3 months.

Table 1 : Call Option Holder's Payoff (Figs. Rupees)

1. LP	: 380	390	400	410	420	430	440	450
2. Max. of (LP-EP), 0	: 0	0	0	10	20	30	40	50
3. CC paid	: 20	20	20	20	20	20	20	20
4. Net pay off (2)-(3)	: -20	-20	-20	-10	0	10	20	20

B with the help of his option trade, limits his loss to a maximum of Rs.20 in case the RIL share does a downswing below Rs.400, but books open ended reward with the share making upswing beyond Rs.400. Between Rs.400 and Rs.420, he simply recovers the Rs.20. CC (read call comission) paid. As RIL share goes beyond Rs.420, net positive pay off results.

A bull operator, who buys now with the hope of selling at a higher price later, will be exposed to unlimited loss if his calculations on price movement get reversed. However, with a call option as an alternative to long position he can reduce risk, while profit opportunity as such is not dimmed. Hence the use of call option for speculators.

Take an investor. He wants to buy RIL shares three months from now. If he waits the time and enters the market by 3 months, he may have to run the risk of paying higher price. Through call option route, at exercise price of Rs.400 per share and CC of Rs.20, his purchase price is fixed at Rs.420 a share if the share goes high enough. If price goes down the investor can purchase the share from the open market: he loses the call premium paid. Whatever the prevailing price then, the investor can get the share for an overall price, not exceeding, Rs.420. Hence the use of call

option for an investor. For the option writer, pay off is the mirror image of the pay off of the option holder.

PUT OPTION :

A put option gives to the option holder right to sell a stock at an agreed exercise price, for an upfront commission payable to the option writer. Say A gives B an option to sell RIL share for Rs.400, 3 months from now, for upfront commission of Rs.15 payable now. So, EP = Rs.400 and put commission = PC = Rs.15. If price of RIL goes above Rs.400, B will not exercise the option and will sell in the open market to realise a higher price. But he loses the PC paid. If the 3 months price of RIL is less than Rs.420, B will exercise the option. Thus the gain for B is maximum of (EP-LP), 0. For different 3 month's later prices (LPs), the pay-off to the put option holder is as follows in Table.2.

Table.2 : Put option Holder's pay off (Fig. Rs.)

1. LP	:	360	370	380	390	400	410	420	430
2. Max. of (EP-LP), 0	:	40	30	20	10	0	0	0	0
3. PC paid	:	15	15	15	15	15	15	15	15
4. Net pay off (2)-(3)	:	25	15	5	-5	-15	-15	-15	-15

For a plain speculator, when later period price goes above the EP, ie. Rs.400, he will alow his option to lapse and his maximum loss is the commission paid, Rs.15. If price falls below EP, further and further, B gains more and more. So, if the

specualtor B expects a fall in price, he can buy put option and benefit. He can book good profit when price goes the way he had foreseen. If it moves otherwise, his loss is limited to the PC paid.

An investor can also benefit from a put option. Whe the sotck price freely falls in the future, by exercising his option he can book gains. If prices rise, he need not exercise the option and sell in the open market. He, of course, loses the put commission paid, in any case. A net price (net of PC, the put commission) of Rs.385 (Rs.400 minus Rs.15, ie. EP-PC) is guaranteed. Thus his realisation per RIL share is RS.385 or more in any case. For the option writer the pay off is the reverse of that of the option holder. .PA

CALL AND PUT OPTION :

The option holder with a call and put option, can buy or sell the share at the EP for the option commision (OC) paid upfront, which is equal to the call commission plus the put commission. Say a call and put option on RIL, 3 months, with EP = Rs.405 is sold for Rs.35. Whatever way, later period price, LP moves the option can be exercised. But the stock must be volatile enough. The pay offs for diff LPs are given in table 3. When LP is less than Rs.405, put option is to be exercised an when LP is more than Rs.405, call option is to be exercised.

Table 3. Pay off for holder of call and put option (fig. Rs.)

1. LP	:	350	370	385	395	405	415	425	450	460
2. EP-LP; LP-EP	:	55	45	20	10	0	10	20	45	55
										(for positive values)
3. OC paid	:	35	35	35	35	35	35	35	35	35
4. Pay off (2)-(3)	:	20	10	-15	-25	-35	-25	-15	10	20

In any case the option is exercised. There is loss to the holder only when the scrip is less volatile and its LP is around the EP. For farther drifts in LP from the EP. the holder stands to gain a lot. Put and call combination is also known as straddle. To the option writer, the pay off is opposite of that of the option holder.

6.6 PROFITS AND LOSSES OF SOME OPTION STRATEGIES

There are other hybrid options like, straddle, strangle strips, strap, and spreads. These are dealt below.

Straddle is nothing but a combinations of call and put options for same exercise price, for same expiration period for the summed up premiums. This type of call and put option is already dealt with.

Strangle is a combination of call and put options for different strike prices. For instance, a call for an EP of Rs.400 and a put for an EP of Rs.420. Here, the option buyer feels the price of the stocks is more likely to fall than to rise. If later period price is between Rs.400 and Rs.420, both the call andput legs of the option

will be exercised. If that price is less than Rs.400 only put portion will be exercised and when price exceeds Rs.420, only call portion will be exercised.

Table 4 gives the pay off for the strangle, for the option holder.

Table 4 : Pay off for a strangle to the holder (fig. Rs.)

1. LP	:	350	370	390	400	410	420	430	450	470
2. Pay off of Put	:									
EP = 420	:	70	50	30	20	10	0	0	0	0
3. Pay off of Call	:									
EP = 400	:	0	0	0	0	10	20	30	50	70
4. Total pay off	:	70	50	30	20	20	20	30	50	70
5. OC (20 + 15)	:	35	35	35	35	35	35	35	35	35
6. Net pay off (4)-(5)	:	35	15	-5	-15	-15	-15	-5	15	35

Strangle is superior to a straddle for peakedness in loss to the holder is avoided, because when the strip's later period price is not as volatile as expected to be, both the call and put legs of the option are exercised limiting loss.

Strip option involves buying two puts and one call on the same stock, at same EP and same expiration period. Obviously strips are speculatives. The buyer of strip feels stronger that the stock will fall than that it will rise. So he goes for two puts and one call. The premium for strip option = premium for 2 puts plus premium for one call. The pay off is worked out as in table 5 for hypothetical figures. For the writer of a strip, the pay off is the reverse.

Table 5 : Pay-off for a holder of a strip : EP=Rs.405. Fig. Rs.

1. LP	:	350	370	390	405	420	440	460	480
2. Max 2 (EP-LP),0	:	110	70	30	0	0	0	0	0
Max. of (LP-EP), 0	:	0	0	0	0	15	35	55	75
3. Total	:	110	70	30	0	15	35	55	75
4. OC paid	:	50	50	50	50	50	50	50	50 (15+15+20)
5. Pay off (3) - (4)	:	60	20	-20	-50	-35	-15	5	25

Strap is opposite of strip. Two calls and one put options when combined a strap is obtained. The exercise price, expiration date, etc. are all same. Buyer of a strap feels stronger that the underlying assets has more chances of appreciation than value depreciation.

For table 5 case, "strap" results are worked out in table 6.

Table 6 : Pay off to holder of a strap (Figs. Rs.)

1. LP	:	340	370	390	405	420	440	460	480	
2. Max of (EP-LP),0	:	65	35	15	0	0	0	0	0	
3. Max. of (LP-EP), 0	:	0	0	0	0	30	70	110	150	
4. Total pay off	:	65	35	15	0	30	70	110	150	
5. OC paid	:	55	55	55	55	55	55	55	55	(15+15+20)
6. Net Pay off (4)-(5)	:	10	-20	-40	-55	-25	15	55	95	

As later period price rises, the strap gives more profit. You may notice strip is more profitable when later period price falls. Thus strip and strap are opposites.

'SPREAD' OPTIONS :

Thus for, we considered an option or more options either bought or sold by a person. In other words, a person happened to be either writer or buyer of options. If the same person writes (ie. sells) an option and buys another option, he is said to be "spreading". Thus spread strategies involve synthesis of writing and buying same type of option at different exercise price. That is, one option is bought while the other is sold. Exercise price is different for the 'written' and "bought" legs. But, expiration date is same for the options traded.

Bullish call spread involves buying a cali with low exercise price and selling a call with high exercise price. On the bought component initial outflow is involved and in the written component intital inflow is involved. Thus spread strategies hlep reducing initial outlay. The person is bullish about the underlying asset. If his calculations go correct, he can buy the stock at the lower exercise price. On the written call, if later period price exceeds the EP, a loss is to be booked otherwise, there is only gain the commission received. Table 7. presents the pay off. Let EP for the bought call be Rs.410, for commission Rs.20; and EP for sold call be Rs.430, commission being Rs.15. The net commission = -Rs.5.

Table 7 : Pay off on Bullish call spread (Fig. Rs.)

1. LP	:	370	390	410	415	420	430	440	450	470
2. Bought call Max. (LP-EP), 0	:	0	0	0	5	10	20	30	40	60
3. Sold Call	:	0	0	0	0	0	0	-10	-20	-40
4. Net commission	:	-5	-5	-5	-5	-5	-5	-5	-5	-5
Pay off	:	-5	-5	-5	0	5	15	15	15	15

For later period price below lower of the exercise prices of the calls transacted there is a net loss, but a fixed loss of Rs.5 only. For later period price falling between the two exercise pirces, diminishing loss, break-even position and entry into profit zone do happen in order with rising LP. As LP reaches the higher of the two exercise prices, profit reaches the maximum and thereafter it remain same for all higher LPs.

Bullish put spread involves buying a put with low exercise price and selling a put with high exercise price. Say the person buys a put with EP = Rs.410 and sells a put with EP = Rs.430. The premium for the former be Rs.15 and for the latter be RS.20. There is a net premium receipt of Rs.5. The person strongly believes the market will rise beyond Rs.430. The payoffs are worked for different LPs in table 8. If his calculations are correct he makes a profit equal to net positive commission received. If price goes below the lower of the two exercise price a net loss, that too fixed at that, is booked. Not a profitable strategy.

1. LP	: 370	390	410	415	420	430	440	450
2. Bought put Max of (EP-LP),0	: 40	20	0	0	0	0	0	0
3. Written put	: -60	-40	-20	-15	-10	0	0	0
4. Total	: -20	-20	-20	-15	-10	0	0	0
5. Net commission	: 5	5	5	5	5	5	5	5
6. Pay off	: -15	-15	-15	-10	-5	5	5	5

Bearish call spread involves writing a call for lower EP earning a higher commission and buying a call for higher EP paying lower commission. There is net positive commission. The trader is bearish and his only possible source of income is net commission received. Let the written call have an EP of Rs.410 giving a commission of Rs.20 and bought call have an EP of Rs.430 with commission paid Rs.15. Net commission income is Rs. 5. Table 9 presents the pay offs and net pay off.

Table 9 : Pay off of Bearish call spread (Fig. Rs.)

1. LP	: 370	390	410	415	420	430	440	450
2. Bought call Max of (LP-EP), 0	: 0	0	0	0	0	0	10	20
3. Sold call	: 0	0	0	-5	-10	-20	-30	-40
4. Total	: 0	0	0	-5	-10	-20	-20	-20
5. Net commission	: 5	5	5	5	5	5	5	5
6. Net pay off	: 5	5	5	0	-5	-15	-15	-15

If later prices goes down, the trader benefits with income equavalent to net commission. This is what he aspired for. If price rises beyond the higher of the two strike prices involved, a fixed loss befalls the trader.

Bearish put spread involves two puts - buying a put with higher EP and writing a put with lower EP. Let the commission for long put (ie., bought put) be Rs.20 and commission for short put (ie., sold put) be Rs.15, giving a net negative commission of Rs.5. Let the EP for long put be Rs.430 and that for short put be Rs.410. The pay offs for different LPs, are given in table 10.

Table 10 : Pay off for bearish put spread (Fig. Rs.)

1. LP	: 370	390	410	415	420	430	440
2. Bought put							
Max of (EP-LP), 0	: 60	40	20	15	0	0	0
3. Sold put pay off	: -40	-20	0	0	0	0	0
4. Total	: 20	20	20	15	0	0	0
5. Net commission	: -5	-5	-5	-5	-5	-5	-5
6. Net pay off	: 15	15	15	10	-5	-5	-5

If as expected LPs are moving down a profit, but fixed one is made. If prices move northwards, a loss equal to net commission paid results.

SYNTHETIC OPTIONS :

Now a case of buying a call and selling a put is involved (In the spread strategies

dealt above buying calls or puts and selling calls or puts were only involved. In straddles either buying a put and call or selling a put and call are involved). Synthetic options are done at the same EP, but commissions differ.

Let a call be bought and put be sold, both at EP Rs.410. Let the commission on the long leg be Rs.20 and the short leg be Rs.15. So, there is a net out go of Rs.5 when the synthetic was entered into. The pay off of the synthetic is given in table 11.

Table 11 : Pay off of Synthetic Option (Fig. Rs.)

1. LP	:	370	390	410	430	450	470
2. Bought call							
Max of (LP-EP), 0	:	0	0	0	20	40	60
3. Sold put	:	-40	-20	0	0	0	0
4. Total	:	-40	-20	0	20	40	60
5. Net commission	:	-5	-5	-5	-5	-5	-5
6. Net pay off	:	-45	-25	-5	15	35	55

Synthetic options do not help in loss minimisation. Consequently no lid on profit is also involved. Hence these are risky.

6.7 INDEX OPTIONS

Not all options are written on individual issues of common stock. In recent years many new options have been created that have as an underlying asset something

other than the stock of a particular company. One of them - index options - is discussed here.

An index option is based on the level of an index of stock prices and thus allows investors to take positions in the market that the index represents. Some indices are designed to reflect movements in the stock market, broadly construed. Other "specialized" indices are intended to capture changes in the fortunes of particular industries or sectors.

Contracts for index options are not stated in terms of numbers of shares. Instead, the size of a contract is determined by multiplying the level of the index by a multiplier specified by the exchange on which the option is traded. The premium (price) of an index option times the applicable multiplier indicates the total amount paid.

Consider, for example, the S&P 100 index call option that is traded on the Chicago Board Options Exchange with an exercise price of 400 and expiring in March 1999. Note that it has an indicated premium of 31 1/8 on December 13, 1996. Because the multiplier for S&P 100 option contracts is 100, this means that an investor would have to pay $3,112.50 (= 31.125 x 100) for this contract (plus a commission).

After purchasing this contract, the investor could later sell it or exercise it for its cash settlement value. Perhaps in February 1999 the S&P 100 will be at 450. In this case the investor could exercise the call, receiving its intrinsic value of $5,000 [= (450 - 400) x 100] for doing so. Alternatively, the investor could simply sell the call on the exchange. In doing so, the amount received would almost certainly greater

than $5,000 because it would sell for an amount equal to the sum of its intrinsic and time values.

QUESTIONS

1. Explain the concept of options and uses of options.
2. Give terminologies associated to options.
3. Give an account of mechanism of trading in options in options exchanges.
4. Explain the concept of value of an option.
5. Present the Black - Scholes model of option pricing.
6. Clearly show the pay off for buyers & writers of put and call option.
7. Explain pay off computation for any four option strategies.
8. What is index option? How is the pay off computed here?
9. What are the determinants of value and price of an option.
10. How options are used to hedge and speculate in stock exchanges?

REFERENCES

1. Investments - William F. Sharpe, et al.
2. Futures & Options - Franklin R. Edwards & Cindy W. Ma

UNIT VII - FUTURES MARKET

In this lesson concept and significance of futures, futures contract, futures market, basis, returns on futures and differences between futures and options are dealt with.

7.1 CONCEPT OF FUTURE

At first glance, a futures contract, like a forward contract is an agreement between two parties to exchange one asset for another, with the actual exchange taking place at a specified date in the future but with the terms of exchange i.e. the price of one asset in terms of another being fixed at the time the agreement is entered into. However, there are a number of significant differences between forwards and futures. These relate to contractual features, the way the markets are organised, profiles of gains and losses, kinds of participants in the markets and the ways in which they use the two instruments. Most of these differences will be explained later and their significance will become clearer as we proceed.

Future contracts in physical commodities such as wheat, cotton, corn, gold, silver, cattle, etc. have existed for a long time. Futures in financial assets, currencies, interest bearing instruments like t-bills and bonds, and other innovations like future contracts in stock indexes are a relatively new development dating back mostly to early seventies in the United States and subsequently in other markets around the world.

7.1.1 FUTURES MARKET

In 1960 4 million futures contracts changed hands on all futures exchanges in the United States. In 1990 nearly 280 million contracts were traded-more each week than in all of 1960. In the last decade alone trading jumped from 98 million to over 276 million contracts. Figure 1-1 depicts thiś phenomenal growth.

The commodities that are traded today have changed dramatically from those of the past. In 1960s most of the trading was in agricultural products, such as corn and soybeans. In 1990s more than half of all futures trading is in financial instruments, such as bonds, stocks, and foreign currencies. Table 7.1 shows the volume of total trading, by type of commodity, for the years 1960 and 1990. In 1960 agricultural products accounted for 78 percent of all trading. In 1990 such trading was less than 21 percent of total futures trading volume. Today (1990), more than 70 percent of trading is done in commodities for which there was no futures trading in 1960.

Table 7.1

Futures contracts traded by commodity group

	1990		1960	
	Contracts	Percentage	Contracts	Percentage
1. Interest rate	123,419,532	44.63	-	-
2. Agricultural	57,088,348	20.64	3,021,844	77.92
3. Energy products	35,441,295	12.82	-	-
4. Foreign Currencies	28,880,894	10.44	-	-
5. Precious metals	14,812,847	5.36	454	0.00
6. Equity indices	14,767,090	5.34	-	-
7. Non-precious Metals	1,853,281	0.67	80,341	2.08
8. Others	272,217	0.10	775,512	20.00
Total	276,535,504	100.00	3,878,151	100.00

Table 7.2 lists the 10 futures contracts that were the most actively traded in 1960 and 1990, respectively, with the date at which trading in each contract began. Taken together, the 10 most active contracts represented 85.15 percent of total trading in 1960, and 72.56 percent in 1990. In 1960 the nine most actively traded contracts were on agricultural commodities. Today six of the ten most active contracts are financial futures, with U.S. Treasury bonds by far the most active accounting for over 27 percent of total trading. Finally, of the ten most active contracts in 1960, only two are among the ten most active today: soybeans and corn.

Table 7.2

Ten most actively traded futures contracts

		1990			1960		
Commodity	Date started	Rank	Contracts	%	Rank	Contracts	%
T-bonds	1977	1	75,499,257	27.30	-	-	-
Eurodollars	1981	2	34,695,625	12.55	-	-	-
Crude Oil	1983	3	23,686,897	8.57	-	-	-
S&P 500	1982	4	12,139,209	4.39	-	-	-
Corn	1921	5	11,423,027	4.13	4	316,843	8.17
Soybeans	1937	6	10,301,905	3.73	1	1,165,464	30.05
Gold	1975	7	9,730,041	3.52	-	-	-
Deutschemark	1972	8	9,169,230	3.32	-	-	-
Japanese Yen	1972	9	7,437,235	2.69	-	-	-
Swiss Franc	1972	10	6,524,893	2.36	-	-	-
Eggs*	1919	-	-	-	2	491,319	12.67
Wheat	1921	-	-	-	3	394,186	10.16
Potatoes*	1931	-	-	-	5	255,559	6.59
Soybean oil	1941	-	-	-	6	212,118	5.47
Soybean meal	1940	-	-	-	7	149,190	3.85
Oats	1921	-	-	-	8	145,407	3.75
Rye*	1921	-	-	-	9	96,189	2.48
Copper	1947	-	-	-	10	76,125	1.96
Total			200,607,319	72.56		3,302,400	85.15

These changes have taken place largely in the last decade. Although trading in foreign currencies began in 1972, and in T-bonds in 1977, it was not until the late 1970s that trading in financial instruments took off. The introduction of stock index futures in 1982 and oil futures in the early 1980s completed the transformation.

The changing nature of futures has meant new types of market participants. Today the largest and most prestigious financial institutions use futures - banks, pension funds, insurance companies, investment companies and university endowment funds. Furthers markets have become an integral part of how these institutions manage their risks and their portfolios of assets.

7.1.2 FUTURE MARKET IN USA

Future contracts must be bought or sold on designated contract markets. A designated contract market is an organized commodities (or futures) exchange that has been so designated under the provisions of the commodity exchange Act. Table 7.3 lists 11 futures exchanges that have received such designation in the United States, and the volume of trading on each exchange. Table 7.4 lists the specific futures contracts traded on each exchange in 1990. The two largest exchanges, the Chicago Board of Trade and the Chicago Mercantile Exchange, alone account for nearly 75 percent of total trading.

Table 7.3
Futures exchange in the United States

Exchange	1990 Trading volume	
	Contracts	Percentage
1. Chicago Board of Trade (CBOT)	120,769,784	43.67
2. Chicago Mercantile Exchange (CME)	84,837,757	30.68
3. New York Mercantile Exchange (NYMEX)	36,357,871	13.15
4. Commodity Exchange (COMEX)	15,496,931	5.60
5. Coffee,sugar & Cocoa Exchange (CSCE)	8,973,911	3.25
6. Mid-America Commodity Exchange (MidAM)	3,975,528	1.44
7. New York Cotton Exchange (NYCE)	2,746,200	0.99
8. New York Futures Exchange (NYFE)	1,656,968	0.60
9. Kansas City Board of Trade (KCBOT)	1,187,083	0.43
10. Minneapolis Grain Exchange (MGE)	478,077	0.17
11. Chicago Rice & Cotton Exchange (CRCE)	55,385	0.02
Total	276,535,504	100.00

7.2 SIGNIFICANCE OF FUTURES

Futures contracts are bought and sold by a large number of individuals and businesses, and for a variety of purposes. Most individuals buy and sell futures because they wish to speculate about future price levels of the commodity that underlies a futures contract, whether it is silver, gold, corn, T-bonds, or crude oil. Businesses usually buy and sell futures for the opposite reason: to eliminate (or hedge) their risk exposure due to changes in the price of a commodity. Managers of

large pools of money, such as pension funds or mutual funds, may also use futures as a less costly way of achieving their portfolio goals. The various objectives and trading strategies associated with using futures markets are the subject to later chapters in the book. At this point we will demonstrate in a very simple context the activities of speculators and hedgers.

7.2.1 SPECULATION

Speculators buy and sell futures contracts with the expectation of profiting from changes in the price of the underlying commodity. A speculator who believes that cash silver prices will be higher in the future may buy silver now and hold if until a future time when he can sell it at the higher price. This is something not everyone may be willing to do, since it involves taking delivery of silver bullion and storing it. Another alternative is for speculators to buy a futures contract that permits them to take delivery of silver at some time in the future, presumably at a time when the price of silver is higher.

Of course, for this strategy to be profitable, the futures price that a speculator pays now will have to be less than the price he will be able to sell the silver for after he takes delivery. Assuming that current futures prices are below what our speculator thinks cash silver prices will be in the future, he will buy a futures contract today, plan to take delivery (or otherwise offset his delivery obligation) of the silver at some point in the future, and then sell the silver at the later time for a profit. If he is wrong, and silver prices do not rise but in fact fall, the speculator will lose money. Thus, trading futures is an easy and low cost way for speculators to make bets on the future prices of various commodities.

7.2.2 HEDGING

Hedgers seek to protect themselves against price changes in a commodity in which they have an interest. They assume a futures position with the objective of reducing their risk. Speculators, in contrast, willingly take on additional risk with the objective of profiting from price changes.

Take the simple case of a farmer, who has planted her corn crop and in waiting to harvest it. She already knows with reasonable certainty what this crop is going to cost her; the cost of the seed, fertilizer, time and effort, and so forth. She does not of course, know how much corn she will harvest. It will depend on the weather. If the weather is favourable, she will have a lot of corn; if unfavourable, there will be less corn. She also does not know the price at which she will be able to sell the corn once it is harvested. Suppose that it is now April and that our farmer anticipates that she will be ready to sell here corn by next September, six months from today. Although the current price of corn is known, no one knows what the price of corn will be in six months - if might be higher or lower.

The farmer is exposed to two types of risk; the possibility that her corn crop will be of a lower quantity than she hopes; and the possibility that, even if her crop yield is good, the price of corn will fall significantly before she has a chance to bring the corn to market and sell it. The first of these is often referred to as quantity risk and the second as price risk.

Futures markets enable the farmer to hedge (or reduce) her price risk. She can accomplish this by selling her corn now, for future delivery by simply selling (or shorting) September corn futures contracts. For example, she can agree now, in

April to sell (or deliver her corn in september when she harvests it, at a price that she agrees to now (in April). The price that the farmer will have agreed to sell corn for September is the current price that is quoted for the September corn futures contract. This price reflects the market's best guess as to what the price of corn will be next September. This guess, of course, could turn out to be wrong the price might be much higher or lower than everybody now thinks it will be. Many things can happen between April and September. For example, the weather may be very dry, making crop yields low. This would cause a sharp rise in prices. Or the opposite could occur. Whatever happens, our farmer, by shorting futures contracts, is protected. She has locked in her selling price. She no longer has any price risk. If she had not hedged, on the other hand, lower prices might have significantly reduced per income. Her earnings may even have fallen short of the cost of growing and delivery the corn.

One of the drawbacks of hedging, it should be recognized, is that by hedging the farmer gives up the possibility of reaping a windfall gain from a sharp rise in the price of corn. If she did nothing, for example, and waited until September to sell her corn and the price of corn rose, she could have benefited handsomely by selling her corn at the higher price. But if the price of corn had gone down instead of up, she would have lost money. Thus, by not hedging, the farmer might have made higher or lower profits than she anticipated, depending on how lucky she was. By hedging, she can eliminate that part of her fate dependent upon the price of corn in the future. Not hedging, is tantamount to making a bet (or speculating) on the price of corn in the future.

It should be obvious that futures markets do not enable hedgers to insulate themselves from quantity risk but only from price risk. For example, if crop yields

are lower than expected, the farmer will have less corn to sell (or deliver) in September and will therefore have lower revenue. Hedgers can lock in only the price of which they will be able to sell in the future; they cannot lock in future revenue.

7.2.3 SOCIAL BENEFITS OF FUTURES MARKETS

Future markets provide two important social benefits; risk management through hedging, and price discovery.

Hedgers use futures to shift unwanted price risk to others, usually speculators, who willingly assume the risk in the hope of making profits. In the absence of future markets, this risk could not be managed as efficiently; the cost-of-risk to society would be higher, and we would all be worse-off.

A second benefit of futures market is price discovery, or the market's ability to "discover"true equilibrium prices. Futures markets provide centralized trading where information about fundamental supply and demand conditions for a commodity is efficiently assimilated and acted on and, as a consequence, equilibrium prices determined.

The economic benefits of having more accurate prices are well-known. More accurate prices result in a superior allocation of resources because both consumers and producers make better decisions about which commodities to consume, which to produce, how to produce them, and how much to produce and consume in the present versus the future.

7.3 FUTURES CONTRACT AND MARKET

In order to fully understand the nature and uses of futures, it is necessary to acquire familiarity with the major features of futures contracts, organisation of the markets and the mechanics of futures trading. At this stage, we want to keep the discussion fairly general. Also we will concentrate on the essential characteristics of futures and not the institutional details. The discussion will serve to bring out the crucial differences between forwards and futures

7.3.1 MAJOR FEATURES OF FUTURES CONTRACTS

As mentioned above, a futures contract is an agreement for future delivery of a specified quantity of a commodity at a specified price. The principal features of the contract are as follows:

ORGANISED EXCHANGES

Unlike forward contracts which are traded in an over-the-counter market, futures are traded on organised exchanges with a designated physical location where trading takes place. This provides a ready, liquid market in which futures can be brought and sold at any time like in a stock market.

STANDARDISATION

As we saw in the case of forward currency contracts, the amount of the commodity to be delivered and the maturity date are negotiated between the buyer and the seller and can be tailor-made to buyer's requirements. In a futures contract

both these are standardised by the exchange on which the contract is traded. Thus for instance, one futures contract in pound sterling on the International Monetary Market (IMM), a financial futures exchange in the US (part of the Chicago Board of Trade or CBT), calls for delivery of 62,500 and contracts are always traded in whole numbers. You cannot buy or sell fractional contracts. Similarly, for each contract, the exchange specifies a set of delivery months and specific delivery days within those months. A three month sterling time deposit contract on the London International Financial Futures Exchange (LIFFE) has March, June, September, December delivery cycle. The exchange also specifies the minimum size of price movement (this is known as a "tick") and, in some cases may also impose a ceiling on the maximum price change within a day. Thus, for a DM contract on LIFFE, the minimum price movement of $0.0001 per DM, which, for a contract size of DM 1,25,000 translates into $12.50 per contract.

CLEARING HOUSE

On the trading floor a futures contract is agreed between two parties A and B. When it is recorded by the exchange, the contract between A and B is immediately replaced by two contracts, one between A and the clearing house and another between B and the clearing house. Thus the exchange interposes itself in every deal, being buyer to every seller and seller to every buyer. This eliminates the need for A and B to investigate each other's creditworthiness and guarantees the financial integrity of the market. The exchange enforces delivery for contracts held till maturity. It protects itself by imposing margin requirements on traders and a system known as **marking to market** described below.

MARGINS

Only members of an exchange can trade in futures contracts on the exchange. The general public use the members' services as brokers to trade on their behalf. (Of course an exchange member can also trade on its own account). A sub-set of exchange members are "clearing members" i.e. members of the clearing house when the clearing house is a subsidiary of the exchange. A non-clearing member must clear all its transactions through a clearing member. Every transaction is thus between an exchange member and the exchange clearing house. The exchange requires that a performance bond in the form of a margin must be deposited with the clearing house by a member who enters into a futures commitment. The amount of the margin is generally between 2.5 to 10% of the value of the contract but can vary. A member acting on behalf of a client, in turn requires the client to post a margin with the member. The margin can be in the form of cash, or securities such as treasury bills or, in some cases, bank letters of credit.

MARKING TO MARKET

Marking to market essentially means that at the end of a trading session, all outstanding contracts are repriced at the settlement price of that session. Margin accounts of those who made losses are debited and of those who gained are credited. This is explained in detail below but a quick example have will be useful. Suppose I buy a June delivery pound sterling future on say April 14 at a price of $1.60 per pound or $100,000 per contract (=62500x1.60). Next day, the price increases and at the end of trading on April 15, settlement price is 1.62. I have made a gain of 2 cents per pound or $1250 per contract. (Obviously, someone with a short position lost a matching amount.) This is credited to my margin account (and I can

immediately withdraw it in cash), and my contract is repriced at 1.62 or $1,01,250 per contract. How this procedure limits the risk of the exchange is discussed below. At this stage you can see an important difference that marking to market creates between forwards and futures. In a forward contract, gains or losses arise only on maturity. There are no intermediate cash flows; in a future contract, even though the overall gain/loss is same, the time profile of its accrual is different - the total gain or loss over the entire period is broken up into a daily series of gains and losses which clearly has a different present value.

ACTUAL DELIVERY IS RARE

In most if all forward contracts, the commodity is actually delivered by the seller and accepted by the buyer. Forward contracts are entered into for acquiring or disposing off the commodity at a future date but at a price known today. In contrast, in most futures markets, actual delivery takes place in less than one percent of the contracts traded. Futures are used as a hedging device against price risk and as a way of betting on price movements rather than as a means of physical acquisition of the underlying asset. Most of the contracts are extinguished before maturity by entering into a matching contract in the opposite direction.

7.3.2 THE FUTURE TRADING PROCESS

'Futures contracts are traded by a system of open outcry on the trading floor (also called the trading pit) of a centralised and regulated exchange. All traders represent exchange members. Those who trade for their own account are called **floor traders** while those who trade on behalf of others are **floor brokers**. Some do both and are called **dual traders**.

The variables to be negotiated in any deal are the price and the number of contracts. A buyer of futures acquires a **long position** while the seller acquires a **short position**. As we have seen above, when two traders agree on a deal, it is entered as a short and a long both vis-a-vis the clearing house.

When a position is opened, the trader (both the long and the short) must post an **initial margin**. As prices change, the contract is marked to market with gains credited to the margin account and losses debited to the account. If, as a result of losses, the amount in the margin account falls below a certain level known as **maintenance margin** the trader receives a **margin call** and must make up the amount to the level of the initial margin in a specified time. If the trader fails to do so, his or her position is liquidated immediately. Thus daily marking to market coupled with margins, limit the loss the exchange or a broker may have to incur to at the most one day's price change.

There are various kinds of orders given to floor traders and brokers. A client may ask his or her broker to buy or sell a certain number of contracts as the best available price (**market orders**) or may specify upper price limit for buy orders and lower limit for sell orders (**limit orders**).

For every contract, the exchange specifies a"last trading day".Those who have not liquidated their contracts at the end of this day are obliged to make or accept delivery as the case may be. For some contracts, there is no physical delivery of the underlying asset but only a cash settlement from losers to the gainers. Where physical delivery is involved, the exchange specifies the mechanism of delivery.

Futures markets also have marketmakers and bid-ask spreads. Floor traders

who perform this service are known as **scalpers**. The rules of futures trading ensure that a single market price is produced at each instant based on competing bids and offers. All bids and offers have to be announced publicly. The highest bid takes precedence over all bids and the lowest offer takes precedence over all offers.This ensures that a sale takes place at the highest bid price currently available and a purchase takes place at the lowest offer bid price currently available. As a consequence, one does not see a spectrum of prices in futures markets as in for instance the interbank forward market in foreign exchange. Since most major banks also participate in currency futures markets, the single price at any time conveys information that helps banks set prices in the interbank over the counter market for currencies.

7.2.3 FUTURE PRICE QUOTATIONS

Financial newspapers such as **The Wall Street Journal** and **The Financial Times** report futures prices on major exchanges every day for the previous day's trading session. Table 7.3 is an extract from the **Wall Street Journal (Europe)** dated 26 February 1992. It contains futures price quotations for some currency and interest rate futures. The interpretation of interest rate futures prices will be dealt with below. Currency futures are quite straightforward.

As seen in the table, for each currency futures contract on the IMM, first the amount of the currency corresponding to the contract is given along with the units in which prices are quoted in this case, US dollars per unit of the currency (or per hundred units as in the case of the yen). Thus one contract is Japanese yen is for 12.5 million while that in Swiss francs is for SF_r 1,25,000. For each contract several rows of data appear corresponding to different maturity months. Thus on February

25, 1992, prices for DM futures maturing in March, June, September and December 1992, are shown in the table. In each row, the successive figures are: (1) The day's opening price (2) Day's highest price, (3) Day's lowest price, (4) the Day's closing or settlement price from the previous day and (5) The open interest. (The newspapers also report lifetime high and low and estimated trading volume not shown in the table). All except the last, have obvious meanings. The "Open interest" figure gives the number of outstanding contracts at the end of the day.

For futures contracts on short-term interest rates such as the Treasury bill contract on the IMM or the Eurodollar contracts on the IMM and the LIFFE, the prices are stated on an index basis. That is, price of the contract is stated as (100 - implied interest rate in %). Obviously, the implied interest rate of 89.81 means, if held to maturity, the buyer will acquire a 3 months sterling time deposit in a bank at an effective interest rate of 10.19% p.a (=100-89.91). If the interest rate increases, the price will decrease and the long position will lose. We will discuss this in greater detail below. The meaning of the various numbers in the quotations of interest rate futures is same as in the case of currency futures.

Table 7.3 Future Prices Quotations 25/2/1992

CURRENCIES

JAPAN YEN (IMM) - 12.5 million yen; $ per yen (OO)

Mar	.7725	.7747	.7690	.7639	-.0042	56348
June	.7715	.7732	.7678	.7680	-.0044	7235
Sept	.7685	.7720	.7685	.7681	-.0045	2114
Oct				.7688	-.0046	1636
Mar'93				.7699	-.0048	1662

DEUTSCHEMARK (IMM) - 125,000 marks; $ per mark

Mar	.6050	.6115	.6005	.6008	-.0025	64414
June	.5972	.6039	.5926	.5929	-.0026	7580
Sept	.5897	.5945	.5869	.4860	-.0026	695
Oct				.5802	-.0026	1506

SWISS FRANC (IMM) - 125,000 francs; $ per franc

Mar	.6689	.6760	.6618	.6620	-.0059	35771
June	.6632	.6705	.6561	.6564	-.0060	3583
Sept	.6595	.6650	.6520	.6520	-.0058	282

INTEREST RATES

EURODOLLAR (LIFFE) -$1 million; pts of 100%

Mar	95.67	95.75	95.66	95.74	+.09	18173
June	95.38	95.50	95.36	95.48	+.12	14361
Sept	95.02	95.14	95.02	95.15	+.16	7678
Dec	94.32	94.47	94.31	94.45	+.16	4012

STERLING (LIFFE) - 50,000; pts of 100%

Mar	89.81	89.93	89.81	89.90	+.10	57774
June	90.07	90.18	90.07	90.16	+.09	81434
Sept	90.39	90.46	90.39	90.43	+.05	16755
Dec	90.56	90.63	90.56	90.60	+.05	15297

7.4 BASIS

The difference between the current spot price on an asset (that is, the price of the asset for immediate delivery) and the corresponding futures price (that is the purchase price stated in the futures contract) is known as the basis for the futures.

Basis = current spot price - future price.

A person with a short position in a futures contract and a long position in the deliverable asset (meaning that he or she owns the asset) will profit if the basis is positive and Mwidens'(or is negative and narrows). This is because the future price will be falling or the spot price will be rising (or both). A falling futures price benefits those who are short futures, and a rising spot price benefits those who own the asset. Using the same type of reasoning, it can be shown that this person will lose if the basis is positive and narrows (or is negative and widens).

7.4.1 SPECULATING ON THE BASIS

As an example, consider the situation where the July futures in wheat at a price of $4 per bushel and the contract was for 5,000 bushels. Assuming that the current spot price of wheat is $4.30 per bushel, the basis is +$.30 (= $4.30 - $4.00). Now imagine that the basis widens by $.10 to +$.40 owing to the futures price falling to $3.95 and the spot price rising to $4.35. (Note that other combinations of price movements could cause the $.10 widening of the basis). A person who has a short portion in one futures contract and a long position of 5,000 bushels of wheat will make a profit of $500 (= $.10 x 5,000 bushels). This is because he or she gains on both the short position in the futures contract (owing to the $.05 fall in the

futures price) and the long position in the asset (owing to the \$.05 rise in its spot price).

However, if the basis narrows by \$.10 to +\$.20, then the person will have a loss of \$500 (=\$.10 x 5,000 bushels). Perhaps the narrowing resulted from both (1) a \$.05 rise in the futures price to \$4.05, causing a \$250 loss on the person's short position, and (2) a \$.05 fall in the spot price to \$4.25, causing a \$2.50 loss on his or her long position.

Note that if the \$.30 basis was negative because the spot price was \$3.70 and it subsequently widened by \$.10 to - \$.40, then the person would have a loss of \$500 (=\$.10 x 5,000 bushels). However, if it narrowed by \$.10 to - \$.20, then he or she would have a gain of \$500. Hence the person gains if the basis is positive and widens or is negative and narrows, but he or she loses if the basis is positive and narrows or is negative and widens:

Long in spot market, short in futures market

	Positive basis	Negative basis
Basis widens	Gain	Loss
Basis narrows	Loss	Gain

Conversely, a person with a long position in a futures contract and a short position in the deliverable asset (meaning that he or she has borrowed the asset and sold it, and now has an obligation to buy the asset in order to repay the loan or has contracted to purchase it at a fixed price) will profit if the basis is positive and narrows (or is negative and widens). However, a loss would be incurred if a positive

basis widened (or a negative basis narrowed).

Short in spot market, long in futures market

	Positive basis	Negative basis
Basis widens	Loss	Gain
Basis narrows	Gain	Loss

The risk that the basis will narrow or widen, causing gains or losses to these people, is known as basis risk. The only type of uncertainty they face concerns the difference between the spot price of the deliverable asset and the price of the futures contract. Such a person is said to be speculating on the basis.

7.4.2 SPREADS

It is quite possible to take a long position in a futures contract and a short position in another futures contact in the same asset, but with a different delivery date. The person who does this is speculating on changes in the difference between the prices of the two contracts, a difference that constitutes the "basis" for these particular positions.

Others attempt to profit from temporary imbalances among the prices of futures contracts on different but related assets. For example, one might take a long position in soyabeans along with a short portion in an item produced from soyabeans, such as soyabean mean. Another possibility involves a position in wheat with an offsetting position in corn, which serves as a substitute for wheat in many applications.

Such people are known as spreaders, and, like those who speculate on the basis, they reduce or eliminate the risk associated with general price moves. Instead, they take on the risk associated with changes in price differences in the hope that their alleged superior knowledge will enable them to consistently make profits from such changes.

7.5 RETURNS ON FUTURES

During the period from 1950 through 1976, a portfolio made up of positions in 23 different commodity futures contracts was compared with a diversified portfolio of common stocks. The average rates of return and risk level of the two portfolios were found to be of similar magnitude:

Portfolio	Average Annual Return	Standard Deviation
Futures	13.83%	22.43%
Common Stocks	13.05	18.95

7.5.1 RETURNS OF FUTURES & COMMON STOCKS PORTFOLIO

Given these results, an investor might view the two alternatives as equally desirable. Better yet, during the period from 1950 to 1976, a combination of the two portfolios was found to be more desirable than either portfolio by itself. This resulted from the fact that the returns of the commodity futures and stock portfolios were negatives correlated, suggested that the return on a combined portfolio would have hac considerably less variation than on either portfolio separately. Specifically, the correlation coefficient was -.24 resulting in the following standard deviations for

portfolios with different combinations:

Present In stocks	Present In futures	Present Deviation	Present Annual Return
0%	100%	22.43%	13.83%
20	80	17.43	13.67
40	60	13.77	13.52
60	40	12.68	13.36
80	20	14.74	13.21
100	0	18.95	13.05

Whereas there was little difference in the average returns of the various portfolios, there was a noticeable difference in their risks. In particular, the portfolio with 60% in stocks and 40% in future seems to have had much less risk than the others.

Also of interest was the observation that commodity futures have been at least a partial hedge against inflation. During the period from 1950 to 1976, the returns on the portfolio of 23 futures were positively correlated with changes in the consumer price index, having a correlation coefficient of .58. In contrast, the returns on the portfolio of common stocks were negatively correlated with changes in the consumer price index, having a correlation coefficient of -.43.

At this point it is appropriate to discuss the pricing of futures contracts. Specifically, what is the relationship between the futures price and investors' expectations of what the spot price will be on the delivery date? And what is the relationship between the futures price and the current spot price of the deliverable asset? The next two sections explore these relationships and provide some answers to the questions.

7.5.2 FUTURES PRICES AND EXPECTED SPOT PRICES

The relationship between futures prices and expected spot prices is explored below.

7.5.2.1 CERTAINTY

If future spot prices could be predicted with certainty, there would be no reason for anyone to be either a buyer or a seller of a futures contract. To understand why, imagine what a futures contract would look like in a world of certainty. First, the purchase price of the futures contract would simply equal the (perfectly predictable) expected spot price on the delivery date. This means that neither buyers nor sellers would be able to make profits from the existence of futures. Second, the purchase price would not change as the delivery date got closer. Finally, no margin would be necessary because there would not be any unexpected "adverse" price movements.

7.5.2.2 UNCERTAINTY

While it is useful to know something about the way in which futures prices and expected spot prices are related to each other in a world of certainty where forecasting is done with complete accuracy, the real world is uncertain. Given this, how are futures prices related to expected spot prices? While there are several possible explanations, no definitive answer has been provided.

One possible explanation is given by the expectations hypothesis: The current purchase price of a futures contract equals the consensus expectation of the spot price on the delivery date. In symbols:

$$\overline{P_f} = P_s$$

Where P_f is the current purchase price of the futures contract and P_s is the expected spot price of the asset on the delivery date. Thus if a July wheat futures contract is currently selling for $4 per bushel, then it can be inferred that the consensus opinion is that in July the spot price of wheat will be $4.

If the expectation hypothesis is correct, a speculator should not expect to either win or lose from a position in the futures market, be it long or short. Neglecting margin requirements, a speculator who takes a long position in futures agrees to pay P_f at the delivery date for an asset that is expected to be worth P_s at that time. Thus the long speculator's expected profit is $P_s - P_f$, which equals zero. Conversely, a speculator with a short position will have sold an asset at a price of P_f and will expect to enter a reversing trade at P_s on the delivery date. Thus the short speculator's expected profit is $P_f - P_s$, which also equals zero.

The expectations hypothesis is often defended on the grounds that speculators are indifferent to risk and are thus happy to accommodate hedgers without any compensation in the form of the risk premium. The reason for their indifference has to do with the belief that the impact of a specific future position on the risk of a diversified portfolio that includes many types of assets will be very small. Thus speculators holding diversified portfolios may be willing to take over some risk from hedgers with little (if any) compensation in the form of a risk premium.

NORMAL BACKWARDATION

The famous economist John Maynard Keynes felt that the expectations

hypothesis did not correctly explain futures prices. He argued that, on balance, hedgers will want to be short in futures, and therefore they will have to entice the speculators to be long in futures. Because there are risks associated with being long, Keynes hypothesized that the hedgers would have to entice the speculators by making the expected return from a long position greater than the riskfree rate. This requires the futures price to be less than the expected spot price:

$$P_f < P_s$$

Thus a speculator who bought a futures contract at a price P_f would expect to be able to sell it on (or near) the delivery date at a higher price P_s. This relationship between the futures price and the expected spot price has been referred to as **normal backwardation** and implies that the price of a futures contract can be expected to rise during its life.

NORMAL CONTANGO

A contrary hypothesis holds that, on balance, hedgers will want to be long in futures and therefore they will have to entice speculators to be short in futures. Because there are risks associated with being short, it can be hypothsized that the hedgers will have to entice the speculators by making the expected return from a short position greater than the riskfree rate. This requires the futures price to be greater than the expected spot price:

$$P_f > P_s$$

Thus a speculator who short sold a futures contract at a price P_f would expect

to be able to buy it back on (or near) the delivery date at a lower price, P_s. This relationship between the futures price and the expected spot price has been referred to as normal Contango and implies that the price of a futures contract can be expected to fall during its life.

7.6 FUTURES VERSUS OPTIONS

People occasionally make the mistake of confusing a futures contract with an options contract. With an options contract there is the possibility that both parties involved will have nothing to do at the end of the life of the contract. In particular, if the option is "out of the money" on the expiration date, then the options contract will be worthless and can be thrown away. However, with a futures contract, both parties involved must do something at the end of the life of the contract. The parties are obligated to complete the transaction, either by a reversing trade or by actual delivery.

7.6.1 DIFFERENCES IN RETURNS

Figure 7.1 contrasts the situation faced by the buyer and the seller of a call option with the situation faced by the buyer and the seller of a futures contract. Specifically, terminal values for buyers and sellers are shown at the last possible moment - the expiration date for the option and the delivery date for the futures contract.

Years ago trustees of the $1 billion General Mills pension fund adopted a disciplined approach to allocating assets among various broad categories. This was accomplished by establishing specific long-run allocation targets: 60% to common

stocks and 40% to fixed-income securities. The trustees believe that this policy asset allocation provides an optimal balance of expected return and risk, given their collective tolerance for possible adverse outcomes. The trustees expects the fund's staff, which handles the fund's day-to-day investment operations, to stick closely to this policy asset allocation. In turn, the staff follows a procedure of reducing exposure to the asset category that has appreciated in relative value and increasing exposure to the asset category that has depreciated in relative value.

To manage the pension fund's assets, the staff had retained what the trustees considered to be a superior group of domestic common stock managers. Over a ten-year period, those managers, in aggregate, had outperformed the S&P by 1.5% annually (after all fees and expenses) - an exceptional amount by the standards of the investment management business. The trustees and staff expected such superior performance to continue in the future.

More recently the trustees found themselves facing a dilemma. The trustees would have liked to have assured more than 60% of the fund's assets to the common stock managers. However, the trustees were also committed to the discipline of their asset allocation process. Could the trustees have their proverbial cake and eat it too? The answer was "Yes", through a concept called transportable alpha.

Consider three strategies through which General Mills could have maintained its policy asset allocation, yet taken advantage of its common stock managers' skills. Each strategy involves allocating more than 60% of the pension fund's assets to the common stock managers, while simultaneously reducing the pension fund's assets to the common stock managers, while simultaneously reducing the pension fund's common stock exposure and increasing its fixed-income exposure in order to comply

with the fund's asset allocation targets.

1. **Long-short strategy** The managers, in aggregate, purchase long positions in stocks as they typically would with their assigned assets. However, they also short sell stocks equal in value to the pension fund's overweighting of domestic equity assets. The cash generated by these short sales is used to buy fixed-income securities that are held as margin, but nevertheless provide returns through interest income and price changes. The particular long-short transactions result from the managers' investment research, which identifies under and over-priced securities.

2. **Futures strategy** The managers purchase long stock positions with their assigned assets. At the same time the pension fund's staff sells futures contracts on a stock market index and buys futures contracts on Treasury bonds in sufficient amounts to compensate for the over- and underweighting of common stocks and fixed-income securities.

3. **Swap strategy** The managers purchase long stock positions with their assigned assets. Through a financial intermediary (such as a bank or a broker) the pension fund "swaps" (exchanges) with another institutional investor the return on a common stock index in order to receive the return on a fixed-income index. These swaps are based on dollar amounts equal to the over and underweightings of the common stocks and fixed-income securities.

In general, these strategies can be characterised as allowing the fund to earn (1) the total return generated by a 40% allocation to fixed-income securities, (2) the total return produced by a 60% allocation to common stocks (that is, the normal plus abnormal returns of the common stock managers), and (3) the abnormal returns

earned by the common stock managers associated with the allocation in excess of 60% to common stocks. The common stock managers' abnormal returns (known as alphas) are effectively "transported" to the fixed-income asset category.

In the final analysis, General Mills chose to implement the second strategy. The pension fund's staff believed that listed futures contracts provided the cheapest and administratively least cumbersome means of carrying out its alpha transport program. Nevertheless, the ability to customize the other strategies to specific situations may make those strategies attractive at times to certain institutional investors.

These strategies highlight fundamental changes in the financial markets that began in the 1980s and have rapidly gathered momentum in the 1990s. Through the development of derivative financial instruments (options, futures, and swaps) and the technological advancements in communications and computing power, financial markets have become highly integrated and fungible. Investors are increasingly able to exploit perceived profit opportunities and simultaneously maintain desired risk positions.

Pacific Investment Management Company (PIMCO) provides another example of the transportable alpha concept. PIMCO is one of the largest fixed-income managers in the world, with assets under management exceeding $60 billion. Over the years, the firm has produced an enviable track record, earning positive risk-adjusted returns under a variety of fixed-income investment assignments.

Since 1986, PIMCO has transported its fixed-income management skills to the U.S. stock market through a product called StocksPlus. PIMCO's process is

simple. The first purchases S&P 500 future contracts equal to a specified notional principal. (A notional principal is the market exposure of the futures contracts - that is, the number of contracts purchased times the contracts' price times the contract multiplier). At the same time PIMCO sets aside cash reserves equal to the notional principal. The cash reserves serve as collateral for the futures contracts.

As the text discusses, futures prices are set by investors' assumption that they can hold a combination of futures contracts and the riskfree asset. PIMCO uses its investment skills to create a short-term fixed-income portfolio that has substantially outperformed 90-day Treasury bills with little incremental risk. As a result, the firm's combination of S&P 500 futures contracts and short-term fixed-income investments has consistently exceeded the returns on the S&P 500.

PIMCO uses a variety of cash management strategies to add value relative to a portfolio of 90-day Treasury bills. The firm takes advantage of the most consistently upward portion of the yield curve - that is, maturities between zero days and one year. As the Stocks Plus strategy needs liquidity from only a small portion of its fixed-income portfolio to meet margin requirements, PIMCO extends roughly one-half of its portfolio to maturities past 90 days. Further, the firm accepts some credit risk by purchasing non-government securities such as commercial paper. PIMCO also takes advantage of certain securities that offer little credit risk, but relatively high yields. At times these securities have included short-term tranches of collateralised mortgage obligations, floating-rate notes, and foreign government short-term securities (with currency risk fully hedged).

Transportable alpha involves investors capturing inefficiencies in certain markets, while maintaining desired exposure to markets beyond those in which the

superior performance is earned. Transportable alpha is not a free lunch. Investors must pay commissions on their trades in stocks, options, futures, and swaps either directly or through bid-ask spreads. Real-world frictions such as collateral requirements and even custodial accounting difficulties still complicate the smooth implementation of the alpha transport strategies. Further, investors must take active management risk in order to earn their alphas. For example, General Mills's common stock managers, in aggregate, may under-perform the stock market, or PIMCO's short-term portfolio may underperform 90-day Treasury bills. However, institutional investors applying the transportable alpha concept believe that their active management investment strategies possess sufficiently positive expected returns that more than compensate for the additional risk assumed.

As to options, no matter what the price of the underlying stock, an option buyer cannot lose and an option seller cannot gain on the expiration date. Option buyers compensate sellers for putting themselves in this position by paying them a premium when the contract is signed.

The situation is quite different with a futures contract. The buyer may gain or lose, depending on the price of the asset in the delivery month. Whatever the buyer gains or loses, an exactly offsetting loss or gain will be registered by the seller. The higher the contract price (that is, the price of the futures contract when the buyer purchased it from the seller), the greater the likelihood that the buyer will lose and the seller will gain. The lower the contract price, the greater the likelihood that the seller will lose and the buyer will gain.

7.6.2 DIFFERENCE BETWEEN FUTURES AND OPTIONS

	Futures contract	Options contract
1.	It is an obligational contract on both parties	It has no obligation on the holder
2.	Futures seller may gain	Option writer cannot gain
3.	Futures buyer may lose	Option holder wont lose
4.	No upfront commission is paid to futures seller	Upfront commission is paid to option seller
5.	Futures are always done in exchanges	There are over-the-counter options contracts as well.

7.7 DERIVATIVES IN EMERGING MARKET

From 1995 onwards, a variety of developments have been taking place in India on the subject of derivatives markets. As we watch these efforts going into the creation of India's exchange-traded derivatives industry, comparisons with international experiences are inevitably useful. Rudolf van der Bijl of the IFC has recently put together an interesting article titled "Exchange-traded derivatives in emerging markets - An overview" which helps us get an overview of what is going on.

Table 7.5 shows the 23 significant exchanges in 16 emerging markets. These countries have come to this level of development via a variety of different routes.

The most interesting and important experience is that of China.a fascinating case study of the merits and demerits of a relatively unregulated start of derivatives trading. In the early 1990s, a plethora of unregulated derivatives exchange came up in China. Many of this exchanges lacked the key institution of the clearing house as counter party, and most of them featured rampant market manipulation where insiders in the exchange management earned abnormal profits at the expense of outside market participants. In 1994, the 50 exchanges were consolidated into 15. In 1995, China's futures markets did a trading volume of around $1.2 trillion (for a comparison, India's equity markets do an annual trading volume of roughly $180 billion).

Many observers have cited China's experience with 50 exchanges as an example of how poorly-regulated and hasty growth of derivatives markets may be problematic. However, the other side of the picture is now clear; the experience with these 50 exchanges got the Chinese markets off the ground, and generated the necessary knowhow amongst exchange staff, regulators and users.

Under a weak legal environment, individuals and firms in the economy face problems in their contractual arrangements with each other. There are strong temptations to renege on a contract given the poor legal support for contract enforcement. In this situation, the futures clearing-house is a vital institution which enables the functioning of the economy by supplying credit guarantees and producing contract performance.

NSE's experience so far is a textbook example of this nature: the introduction of the clearing corporation (NSCC) has enabled a large-scale participation in the market by many individuals and firms which would otherwise have been thought uncreditworthy; this has enabled the growth of liquidity in the market and lowered entry barriers in the securities industry. If the legal system had been strong, then many of these firms could have fully participated in the economy even without the existence of NSCC.

Some evidence about the impact of derivatives on equity markets is summarised in Table 7.6. Empirical evidence shows significant gains in both market capitalisation and in trading volume on the cash market following the launch of trading in index derivatives. However, since countries often venture into derivatives as part of a broader economic liberalisation process, these gains are partly the consequence of a contemporaneous liberalisation process and solely owing to the launch of equity derivatives.

Table 7.7 shows 13 emerging markets where derivatives markets are at various stages of implementation. An important case study is Mexico, which is in the same time zone as Chicago: the derivatives exchanges of Chicago have done a thorough job of launching numerous derivative products based on Mexican underlyings. This has made the creation of exchanges in Mexico much harder. Taiwan is another interesting case study. Taiwan is like India in the enormous delays which have beset the creation of a domestic derivatives exchange. In January 1997, markets in Chicago and Singapore started trading futures on a Taiwanese market index.

These episodes are reminders that the development of the derivatives area should be viewed in the global perspective and not just as an Indian question. Exchanges such as the Chicago Mercantile Exchange (CME), Chicago Board of

Trade (CBOT), Chicago Board Options Exchange (CBOE), American Stock Exchange, Sydney Futures Exchange, Hong Kong Futures Exchange and Singapore International Monetary Exchange (SIMEX) have all launched emerging market initiatives, whereby they aim to trade derivatives off underlyings from emerging markets. As far as Indian underlyings go, the two main objectives for these exchanges are a well-structured market index and the dollar-rupee exchange rate, based on which these exchanges would trade options and futures. Delays in the creation of exchange-traded derivatives in India are beneficial to them, and hinder the future potential of exchange in India.

What are the problems which seem to bedevil the growth of derivatives markets across emerging markets in general? One source of difficulty is poor infrastructure, particularly in clearing and settlement. In India, two major initiatives in clearing for derivatives are National Securities Clearing Corporation (NSCC) which was created by NSE, and the First Commodities Clearing Corporation of India (FCCCI) which is being set up at the Pepper Futures market in Kochi.

National Securities Clearing Corporation (NSCC) was the first effort in clearing where the clearing corporation becomes the legal counter party to both legs of every transaction, and thus eliminates counter party risk. Until June 1996, NSCC was not doing this, and this vital infrastructure was lacking in the country, hence NSE's derivatives market could not have been launched. From June 1996 (i.e., a year ago) onwards, NSE's development effort was complete in having the NSE-50 index, a computerised trading mechanism, and a strong clearing mechanism..PA

Looking beyond equity, regulatory difficulties will arise. There is a considerable potential for conflicts between SEBI (which governs exchanges), RBI (which

traditionally governs banking, the fixed-income market and the foreign exchange market) and the FMC (which regulates the commodity futures markets).

Derivatives is an area where a unified picture of the entire securities industry - spanning equity, debt, foreign exchange, commodities and real estate - is enormously useful. The great derivatives exchanges of the world simultaneously trade derivatives on all of equity, debt, foreign exchange, commodities and real estate. In this sense, the basic policy issues faced in the derivatives area (market manipulation, strength of the clearing house and competition between exchanges worldwide) are universal to all five major markets.

While the focus of developing exchange-traded derivatives in India has been on futures on the equity index, the question of the RBI's regulatory approach looms large over the development of the derivatives exchanges, since interest-rate and currency futures are the next crucial steps in the development of the markets.

A clarification of some these issues is a major question in the agenda for policy-making in India's financial sector. Perhaps, this task rightfully upon the finance ministry, which would steer SEBI, RBI and FMC into an equilibrium conducive to the health of exchange-traded derivatives.

TABLE 7.5
DERIVATIVES EXCHANGES IN EMERGING MARKETS

Brazil (BM&F)	China (SSE,SME,SHME,SCCFE)
Guatemala (BDP)	Hungary (BCE & BSE)
Korea (KSE)	Malaysia (KLOFFE,KLCE)
Philippines (MIFE)	Portugal (PSE)
Russia (MICEX & MCE)	Siovak Republic (Bratislava)
Slovenia (Ljubijana)	South Africa (SAFEX)
Argentina (MERFOX)	Spain (Meff Renta)
Singapore (SIMEX)	Hong Kong (HKFE,SEHK)

TABLE 7.6
IMPACT OF INDEX DERIVATIVES UPON THE EQUITY SPOT MARKET

COUNTRY	YR.OF LAUNCH	1YR.BEFORE MKT.CAP	TRAD.VOL	2 YRS.AFTER MKT.CAP	TRAD.VOL.
Argentina	1991	3	1	44	10
Brazil	1986	43	21	32	17
Spain	1992	148	41	155	62
Singapore	1986	11	1	24	4
Hong Kong	1986	35	10	74	23

TABLE 7.7

EMERGING MARKETS WORKING TOWARDS DERIVATIVES

Turkey	Bulgaria	Chile
Colombia	Costa Rica	Czeck Republic
Greece	India	Indonesia
Mexico	Poland	Taiwan
Thailand		

QUESTIONS

1. What are furtures? Explain the futures market and its significance.
2. Give an account of futures market functioning.
3. Describe features of futures contracts.
4. Explain the functionaries in futures market.
5. What is called "basis". How is speculating on basis done? What is spread?
6. Give an account of returns on futures? How do the same result?
7. Distinguish futures from options.

REFERENCES

1. Investments, William F. Sharpe. et.al.
2. International Financial Management - P.G.Apte
3. Futures & Options - Franklin R.Edwards and Cindy W. Ma.
4. Economic Times (Article) - Ajay Shah of Indira Gandhi Institute of Developmental Research. Mumbai. (1. July 1997).

PAPER: INVESTMENTS AND DERIVATIVES MARKET
MODEL QUESTION PAPER

TIME: 3 hours **MAX: 100 Marks**

PART-A **(5 * 8 = 40 marks)**

Answer any FIVE questions

1. Give the concept of convexity.
2. Explain bond straps.
3. Explain the features of equity market.
4. Present the significance of P.E ratio.
5. A dept securities face value Rs 1000, is having a coupon of 14%. It is redeemable after 5 years at a premium of 10%. Issue cost is 5%. Corporate tax rate is 40%.Find the after tax cost of debt.
6. Who are primary dealers in the government security market?
7. Given call premium of Rs 30 and exercise price of Rs 1000, Find the pay-off for call given writer and holder, if future price happens to be
   Rs 990, 1000, 1010, 1020, 1030, 1040 and Rs1050
8. Contrast options and futures

PART B **(4 * 15 = 60 marks)**

Answer any FOUR questions

9. Explain the different debt pricing theorems.
10. Discuss the concept and process of passive immunisation.
11. Present the factors that govern equity market trend.
12. A scrip has the following dividend history: Rs 6, Rs 6.6 and Rs 7.26 during the last 3 years. For next 4 years the dividend is expected to maintain fast growth rate. Afterwards the growth rate is expected to be 15%. If the cost of equity is 20%, find the current value of the scrip.
13. Explain the instruments and operations of government securities market.
14. Present the pay-off of strangle, straddle and butterfly option strategies.
15. Explain the features and significance of stock futures.

Educate ⇗ Empower ⇗ Elevate

Alagappa University formed in 1985 has emerged from the galaxy of institutions initially founded by the munificent and multifaceted personality, Dr. RM. Alagappa Chettiar in his home town at Karaikudi. Groomed to prominence as yet another academic constellation in Tamil Nadu, it is located in a sprawling and ideally suited expanse of about 420 acres in Karaikudi.

Alagappa University was established in 1985 under an Act of the State Legislature. The University is recognised under Sec. 2(f) and Sec. 12(B) of the University Grants Commission. It is a member of the Association of Commonwealth Universities and the Association of Indian Universities. The University is accredited with 'A' Grade by NAAC.

The Directorate of Distance Education offers various innovative, job-oriented and socially relevant academic programmes in the field of Arts, Science, IT, Education and Management at the graduate and post-graduate levels. It has an excellent network of Study Centres throughout the country for providing effective service to the student community.

The distance education programmes are also offered in South-East Asian countries such as Singapore and Malaysia; in Middle-East countries, viz., Bahrain, Qatar, Dubai; and also at Nepal and Sri Lanka. The programmes are well received in India and abroad.



ALAGAPPA UNIVERSITY

(Accredited with 'A' Grade by NAAC)

Karaikudi 630 003

DIRECTORATE OF DISTANCE EDUCATION

(Recognized by Distance Education Council (DEC), New Delhi)